257

CATALOGUE

OF

PRACTICAL AND SCIENTIFIC BOOKS,

PUBLISHED BY

HENRY CAREY BAIRD & CO.,

INDUSTRIAL PUBLISHERS AND BOOKSELLERS,

No. 406 WALNUT STREET,

PHILADELPHIA.

☞ Any of the Books comprised in this Catalogue will be sent by mail, free of postage, at the publication price.

☞ This Catalogue will be sent, free of postage, to any one who will furnish the publisher with his address.

Armengaud, Amoroux, and Johnson.—The Practical Draughtsman's Book of Industrial Design, and Machinist's and Engineer's Drawing Companion:

Forming a Complete Course of Mechanical Engineering and Architectural Drawing. From the French of M. Armengaud the elder, Prof. of Design in the Conservatoire of Arts and Industry, Paris, and MM. Armengaud the younger, and Amoroux, Civil Engineers. Rewritten and arranged with additional matter and plates, selections from and examples of the most useful and generally employed mechanism of the day. By WILLIAM JOHNSON, Assoc. Inst. C. E., Editor of "The Practical Mechanic's Journal." Illustrated by fifty folio steel plates, and fifty wood-cuts. A new edition, 4to., ... $10 00

Among the contents are:—*Linear Drawing, Definitions, and Problems,* Plate I. Applications, Designs for inlaid Pavements, Ceilings, and Balconies, Plate II. Sweeps, Sections, and Mouldings, Plate III. Elementary Gothic Forms and Rosettes, Plate IV. Ovals, Ellipses, Parabolas, and Volutes, Plate V. Rules and Practical Data. *Study of Projections,* Elementary Principles, Plate VI. Of Prisms and other Solids, Plate VII. Rules and Practical Data. *On Coloring Sections, with Applications*—Conventional Colors, Composition or Mixture of Colors, Plate X. *Continuation of the Study of Projections*—Use of sections—details of machinery, Plate XI. Simple applications—spindles, shafts, couplings, wooden patterns, Plate XII. Method of constructing a wooden model or pattern of a coupling, Elementary applications—rails and chairs for

railways, Plate XIII. *Rules and Practical Data*—Strength of material, Resistance to compression or crushing force, Tensional Resistance, Resistance to flexure, Resistance to torsion, Friction of surfaces in contact.

The Intersection and Development of Surfaces with Applications.—*The Intersection of Cylinders and Cones*, Plate XIV. *The Delineation and Development of Helices, Screws, and Serpentines*, Plate XV. Application of the helix—the construction of a staircase, Plate XVI. The Intersection of surfaces—applications to stop-cocks, Plate XVII. *Rules and Practical Data*—Steam, Unity of heat, Heating surface, Calculation of the dimensions of boilers, Dimensions of fire grates, Chimneys, Safety valves.

The Study and Construction of Toothed Gear.—Involute, cycloid, and epicycloid, Plates XVIII. and XIX. Involute, Fig. 1, Plate XVIII. Cycloid, Fig. 2, Plate XVIII. External epicycloid, described by a circle rolling about a fixed circle inside it, Fig. 3, Plate XIX. Internal epicycloid, Fig. 2, Plate XIX. Delineation of a rack and pinion in gear, Fig. 4, Plate XVIII. Gearing of a worm with a worm-wheel, Figs. 5 and 6, Plate XVIII. *Cylindrical or Spur Gearing*, Plate XIX. Practical delineation of a couple of Spur-wheels, Plate XX. *The Delineation and Construction of Wooden Patterns for Toothed Wheels*, Plate XXI. *Rules and Practical Data*—Toothed Gearing, Angular and circumferential velocity of wheels, Dimensions of gearing, Thickness of the teeth, Pitch of the Teeth, Dimensions of the web, Number and dimensions of the arms, wooden patterns.

Continuation of the Study of Toothed Gear.—Design for a pair of bevel-wheels in gear, Plate XXII. Construction of wooden patterns for a pair of bevel-wheels, Plate XXIII. *Involute and Helical Teeth*, Plate XXIV. *Contrivances for obtaining Differential Movements*—The delineation of eccentrics and cams, Plate XXV. *Rules and Practical Data*—Mechanical work of effect, The simple machines, Centre of gravity, On estimating the power of prime movers, Calculation for the brake, The fall of bodies, Momentum, Central forces.

Elementary Principles of Shadows—*Shadows of Prisms, Pyramids, and Cylinders*, Plate XXVI. *Principles of Shading*, Plate XXVII. *Continuation of the Study of Shadows*, Plate XXVIII. *Tuscan Order*, Plate XXIX. *Rules and Practical Data*—Pumps, Hydrostatic principles, Forcing pumps, Lifting and forcing pumps, The Hydrostatic press, Hydrostatical calculations and data—discharge of water through different orifices, Gauging of a water-course of uniform section and fall, Velocity of the bottom of water-courses, Calculations of the discharge of water through rectangular orifices of narrow edges, Calculation of the discharge of water through overshot outlets, To determine the width of an overshot outlet, To determine the depth of the outlet, Outlet with a spout or duct.

Application of Shadows to Toothed Gear, Plate XXX. *Application of Shadows to Screws*, Plate XXXI. *Application of Shadows to a Boiler and its Furnace*, Plate XXXII. *Shading in Black—Shading in Colors*, Plate XXXIII.

The Cutting and Shaping of Masonry, Plate XXXIV. *Rules and Practical Data*—Hydraulic motors. Undershot water-wheels, with plane floats and a circular channel, Width, Diameter, Velocity, Number, and Capacity of the buckets, Useful effect of the water-wheel, Overshot water-wheels, Water-wheels with Radical floats, Water-wheel with curved buckets, Turbines. *Remarks on Machine Tools.*

The Study of Machinery and Sketching.—Various applications and combinations: *The Sketching of Machinery*, Plates XXXV. and XXXVI. *Drilling Machines; Motive Machines;* Water-wheels, Construction and setting up of water-wheels, Delineation of water-wheels, Design of a water-wheel, Sketch of a water-wheel; *Overshot Water-wheels, Water Pumps*, Plate XXXVII. *Steam Motors;* High pressure expansive steam-engine, Plates XXXVIII., XXXIX., and XL. *Details of Construction; Movements of the Distribution and Expansion Valves; Rules and Practical Data.*—Steam-engines; Low-pressure condensing engines without expansion valve, Diameter of piston, Velocities, Steam pipes and passages, Air-pump and condenser, Cold-water and feed-pumps, High-pressure expansive engines, Medium pressure condensing and expansive steam-engine, Conical pendulum or centrifugal governor.

Oblique Projections.—Application of rules to the delineation of an oscillating cylinder, Plate XLI.

Parallel Perspective.—Principles and applications, Plate XLII.

True Perspective.—Elementary principles, Plate XLIII. Applications—flour mill driven by belts, Plates XLIV. and XLV. Description of the mill. Representation of the mill in perspective, Notes of recent improvements in flour mills, Schiele's mill, Mullin's "ring millstone," Barnett's millstone, Hastie's arrangement for driving mills, Currie's improvements in millstones. *Rules and Practical Data*—Work performed by various machines, Flour mills, Saw-mills, Veneer sawing machines, Circular saws.

Examples of Finished Drawings of Machinery.—Plate A, Balance water-

meter; Plate B, Engineer's shaping machine; Plates C, D, E, express locomotive engine; Plate F, Wood planing machine; Plate G, Washing machine for piece goods; Plate H, power-loom; Plate I, Duplex steam boiler; Plate J, Direct-acting marine engines.

DRAWING INSTRUMENTS.

Arlot.—A Complete Guide for Coach Painters.

Translated from the French of M. ARLOT, Coach Painter; for eleven years Foreman of Painting to M. Eherler, Coach Maker, Paris. By A. A. FESQUET, Chemist and Engineer. To which is added an Appendix, containing Information respecting the Materials and the Practice of Coach and Car Painting and Varnishing in the United States and Great Britain. 12mo. $1 25

CONTENTS.—CHAP. I.—NEW BODIES. Art. 1. Fonndation or Filling Coats with Fatty Oils. 2. Hard Filling Coats (Rough Stuffs). 3. Laying Priming and Filling Coats. 4. First Puttying Up and Guide Coat. 5. Pumicing or Pouncing. 6. First Disguise Coat (Gray Lead). 7. Putties—Last Puttying Up and Pumicing Monkey Seat (Culs de Singe) Panels. 8. The Body Itself. 9. Laying Transparent Colors in General Blues, Lakes, and other Colors. 10. Laying on Rubbing Varnishes. 11. Polishing. 12. Mending and Fixing. 13. The Last Varnishing. II.—NEW RUNNING GEARS OR CARRIAGE PARTS. Art. 1. Priming and Sand-papering. 2. Disguise Coat. 3. Puttying and Levelling. 4. Varnishing. 5. Polishing. 6. Striping. 7. Finishing Varnish. III.—OLD CARRIAGES PAINTED AFRESH. Art. 1. Bodies. 2. Gears. IV.—VARNISHING BODIES AFRESH. V.—VARNISHING GEARS AFRESH. VI.—HALF PAINTING WORK. VII.—PAINTING BODY FOR EXTRA HURRIED WORK. VIII.—PAINTING GEARS FOR EXTRA HURRIED WORK. IX.—ORNAMENTAL STRIPING. X.—MENDING DENTS, BRUISES, &C. XI.—COLORS, HOW PREPARED AND USED. Art. 1. Yellows. 2. Vermilions. 3. Lakes. 4. Ivory-Black. 5. Blues. 6. Fine Green (*Vert Fin*). 7. Van Dyck Brown. 8. Umber. 9. Whitelead. 10 Ochres. 11. Precautions to be taken with Colors. XII.—LIQUIDS, THEIR USE AND QUALITY. Art. 1. Varnish No. 1, Varnish No. 2, Varnish No. 3. 2. Dryers, Gold Size. 3. Linseed Oil. 4. Turpentine. 5. Mixture for Gilding, and How to Use it. XIII.—CANEWORK. XIV.—ACCIDENTS IN GENERAL. Art. 1. Crawling, Gathering Up. 2. Blisters. 3. Cracks. 4. Swelling of Leather. 5. Pits in Varnish. 6. Scaling off of the Paint, and its Causes. 7. Stains on Varnished Paints. 8. Leather Panels. 9. Loosening of the Leathers. XV.—MISCELLANEOUS. Art. 1. Iron Panels. 2. Brushes, Tools, and Pencils. 3. Compounding various Fancy Shades: Yellows, Straw Yellow, Citron or Lemon Yellow, Coffee and Milk Yellow, Fire Yellow, Nankin Yellow, Chamois Yellow. 4. White. 5. Greens: Imperial Green, Dead Leaf Green, Bottle Green, Water or Sea Green. 6. Browns: Spanish Tobacco Brown, Carmelite Brown, Umber Brown, Burnt and Raw. 7. Raven-Wing Black, Negro-Head Black, London-Smoke Black. 8. Various Colors: Violet, Pink, Lilac. 9. Fancy Groundworks: Gold Ground, Tortoise Ground, Avanturine Ground, Spangled Grounds, Ruled Grounds, Imitation of Balusters, Grounds with Natural Cane, Ground with Inverted Hexagons, Imitation of Blinds. 10. Process for Making a Sample of an Ornament for Coach Painting. CONCLUDING NOTE OF THE AUTHOR.

APPENDIX.—Coach and Car Painting in London; Coach Painting in Leeds: Preparation of Body for Color, Gears, Finishing the Body, Finishing the Carriage Parts. Painting Railway Cars; Painting and Trimming; Imitation Canework; Difficulties in Carriage Painting; Improvements in Coach Painting; Boiled Oil; Gilding; Permanent Wood Filling; A New Process for Determining the Comparative Value of Whitelead: Properties of Whitelead, The Test, Oxide of Zinc, Conclusion; Vermilion; Darkening of Vermilion; Vermilion Again; Vermilion Again; Paris Green; Varnish Rooms; Carriage Varnishing Rooms; Care of Varnish Brushes; Thickening of Varnish; Hardening Varnish; Black Body Varnish; Too Quick Drying; Uncorking Varnish; Varnish in Colors; Spotting of Varnish by Mud; Specks in Varnish. Prize Essay: Japan Gold Size, Flatting Varnish, English Receipt for Rough Stuff, Varnish Manufacture in the United States. Coach Varnishes: The Different Grades; Masury's Fine Colors for Coach and Carriage Painters, and Ornamental Car Work; Whitelead. INDEX.

Arrowsmith.—Paper-Hanger's Companion:

A Treatise in which the Practical Operations of the Trade are Systematically laid down: with Copious Directions Preparatory to Papering; Preventives against the Effect of Damp on Walls; the Various Cements and Pastes Adapted to the Several Purposes of the Trade; Observations and Directions for the Panelling and Ornamenting of Rooms, &c. By JAMES ARROWSMITH, Author of "Analysis of Drapery," &c. 12mo., cloth. $1 25.

CONTENTS.—Tools for Paper Hanging, Paste for Paper Hanging, Sizing of Walls, &c., Preparation of Walls or Grounds for Paper Hanging, White or Colored. Walls for Distemper.

ON THE PREPARATION OF GROUNDS AFFECTED WITH DAMP.—1. Battening for lath and plaster. 2. Battening and canvassing. 3. Hamlin's Patent Mastic. 4. Sheet lead, as manufactured in rolls at the lead mills. 5. Pitched paper. 6. Strong brown paper. 7. Composition of clay and drying paint. 8. Dry rot. 9. Ivy or exterior walls. General remarks. Lining paper, India paper, on the hanging of flock papers with crimson stained grounds, Panelling, Directions for preparing and hanging an apartment with printed cotton, coloring in distemper. APPENDIX.—Upholstering, Drawing-room, Lady's Boudoir, Library, Bed Rooms, State Rooms, Explanation of the table of Festoons, Table of Festoons.

Ashton.—The Theory and Practice of the Art of Designing Fancy Cotton and Woollen Cloths from Sample.

Giving full instructions for reducing drafts, as well as the methods of spooling and making out harness for cross drafts and finding any required reed; with calculations and tables of yarn. By FREDERICK T. ASHTON, Designer, West Pittsfield, Mass. With fifty-two illustrations. One vol. folio. $10 00

Baird.—The American Cotton Spinner, and Manager's and Carder's Guide.

A Practical Treatise on Cotton Spinning; giving the Dimensions and Speed of Machinery, Draught and Twist Calculations, etc.; with notices of recent Improvements: together with Rules and Examples for making changes in the sizes and numbers of Roving and Yarn. Compiled from the papers of the late ROBERT H. BAIRD. 12mo. . . . $1 50

CONTENTS.—Introduction; On the Plan of a Factory Building; On the Main Gearing; On Water-wheels; Calculations of Horse-Power, for Propelling Cotton Spinning Machinery; Willie or Picking Machine; On Willeying Cotton; Spreading Machine; On Spreading Cotton; Carding; Cards and Carding; Covering Emery Rollers and Emeries; The Drawing-frame; Roving; General Remarks on Drawing and Roving; Throstles; Remarks on Throstles; Mule Spinning; General Observations on Mule Spinning; Weaving; Belting; Miscellaneous matters.

Baird.—Some of the Fallacies of British-Free-Trade-Revenue-Reform.

Two Letters to Arthur Latham Perry, Professor of History and Political Economy in Williams College. By HENRY CAREY BAIRD. Pamphlet.

05

Baird.—Protection of Home Labor and Home Productions neccessary to the Prosperity of the American Farmer.

By HENRY CAREY BAIRD. 8vo., paper 10

Baird.—The Rights of American Producers, and the Wrongs of British-Free-Trade Revenue-Reform.

By HENRY CAREY BAIRD. Pamphlet 05

Baird.—Standard Wages Computing Tables:

An Improvement in all former Methods of Computation, so arranged that wages for days, hours, or fractions of hours, at a specified rate per day or hour, may be ascertained at a glance. By T. SPANGLER BAIRD. Oblong folio $5 00

Baker.—Long-Span Railway Bridges:

Comprising Investigations of the Comparative Theoretical and Practical Advantages of the various Adopted or Proposed Type Systems of Construction; with nnmerous Formulæ and Tables. By B. BAKER. 12mo. $2 00

Bauerman.—A Treatise on the Metallurgy of Iron:

Containing Outlines of the History of Iron Manufacture, Methods of Assay, and Analysis of Iron Ores, Processes of Manufacture of Iron and Steel, etc. etc. By H. BAUERMAN, F. G. S., Associate of the Royal School of Mines: First American Edition, Revised and Enlarged. With an Appendix on the Martin Process for Making Steel, from the Report of ABRAM S. HEWITT, U. S. Commissioner to the Universal Exposition at Paris, 1867. Illustrated with numerous wood engravings. 12mo. $2 00

Byles.—Sophisms of Free Trade and Popular Political Economy Examined.

By a BARRISTER (Sir JOHN BARNARD BYLES, Judge of Common Pleas). First American from the Ninth English Edition, as published by the Manchester Reciprocity Association. In one vol. 12mo. Paper, 75 cts. Cloth $1 25

CONTENTS.—*Positions Examined.* CHAPTER I. Political economy is a science. II. Legislate on sound principles. III. Let things alone—Laissez faire, laissez aller. IV. Foreign commodities are always paid for by British commodities; therefore, the purchase of foreign commodities encourages British industry as much as the purchase of British commodities. V. Buy in the cheapest market. VI. If all countries practised free-trade, all countries would be gainers. VII. Protected manufactures are sickly. VIII. Pas trop gouverner—Don't over-govern. IX. What is the good of Colonies?

X. Protection would destroy external trade. XI. The distress of the country is owing to taxes, and the expenditure of government. XII. Increase of exports and imports is the index of national prosperity. XIII. All commodities should be rendered as cheap as possible. XIV. Free importation is the source of plenty; protection, of scarcity. XV. England has a greater capital than any other country. XVI. Free-trade for Ireland, and the evils of Ireland will work their own cure. XVII. The currency should vary, as it would vary, if it were entirely metallic. XVIII. Higher wages will but increase population. XIX. It is preposterous to interfere with a man's management of his own property. XX. Beware of having recourse to inferior soils. XXI. Don't undertake to employ the able-bodied pauper productively. XXII. Don't attempt to reduce the capital of the national debt; let the taxes rather fructify in the pockets of the people. XXIII. Absenteeism is no evil. XXIV. Other nations will follow our example of free-trade. XXV. A return to the protective policy will never be. XXVI. To raise the wages of labor is to impair the fund out of which wages are paid. XXVII. Don't tax the nation for the benefit of a producing class; take care of the consumer, and let the producer take care of himself. XXVIII. Individuals know their own interests, and may and should be left to take care of them in their own way; for the interest of individuals, and the interest of the public, which is but an aggregation of individuals, coincide. XXIX. England may be made the work-shop of the world. XXX. War and invasion are but dangers of bygone ages. XXXI. The Navigation Laws were useless and injurious. XXXII. Labor should be left to flow in its own natural channels. XXXIII. The value of everything must now be settled by universal and unregulated competition. XXXIV. Farming should be carried on like any other trade. XXXV. Repeal the Bubble Act.

Beans.—A Treatise on Railway Curves and the Location of Railroads.

By E. W. Beans, C. E. Illustrated. 12mo. Tucks . . $1 50

Bell.—Carpentry Made Easy:

Or, The Science and Art of Framing on a New and Improved System. With Specific Instructions for Building Balloon Frames, Barn Frames, Mill Frames, Warehouses, Church Spires, etc. Comprising also a System of Bridge Building, with Bills, Estimates of Cost, and valuable Tables. Illustrated by thirty-eight plates, comprising nearly 200 figures. By William E. Bell, Architect and Practical Builder. 8vo. . $5 00

Contents.—Part I. Geometry. Part II. Carpentry. Use of the Square in Obtaining Bevels. Balloon Frames, Barn Frames, Mill Frames, Scarping, Floors in Brick Buildings, Circular Centres, Elliptical Centres, Arches, Hip Roofs, Hips and Valleys, Trapezoidal Hip Roofs, Octagonal and Hexagonal Roofs, Roofs of Brick and Stone Buildings, Church Spires, Domes. Part III. Bridge Building. Straining Beam Bridges, Trestle Bridges, Arch Truss Bridges, General Principles of Bridge Building. Part IV. Explanation of the Tables.

Bemrose.—Manual of Wood Carving:

With Practical Illustrations for Learners of the Art, and Original and Selected Designs. By William Bemrose, Jr. With an Introduction by Llewellyn Jewitt, F. S. A., etc. With 128 Illustrations 4to., cloth. $3 00

Bicknell's Village Builder, and Supplement.

Elevations and Plans for Cottages, Villas, Suburban Residences, Farm Houses, Stables and Carriage Houses, Store Fronts, School Houses,

Churches, Court Houses, and a model Jail; also, Exterior and Interior details for Public and Private Buildings, with approved Forms of Contracts and Specifications, including Prices of Building Materials and Labor at Boston, Mass., and St. Louis, Mo. Containing seventy-five plates drawn to scale; showing the style and cost of building in different sections of the country, being an original work comprisiug the designs of twenty leading architects, representing the New England, Middle, Western, and Southwestern States. 4to. $12 00

CONTENTS.—Specifications; Form of Contract; Approved Form of Contract adopted by the St. Louis Co-operative Building Association; Prices of Building Material and Labor at Boston and St. Louis; Perspective View, front and side elevations of Bay Co. Court House, Bay City, Mich.; Three Designs for cheap Frame Cottages; Design for a French Cottage; Design for a Cottage; Design for an Italian Cottage; Elevations, Plans, and Details for a Gothic Cottage; Design for a Frame Cottage Villa; Design for a cheap Residence with French Roof; Design for a Two-story Brick Suburban Residence; Design for a Dwelling, style French Mansard; Design for Suburban Residence; Design for First-class Dwelling; Design for a Farm House; Design for a Handsome Suburban Residence; Model Design for a cheap Dwelling; Perspective View, Front Elevation, and Plan for a First-class Stable; Elevations and Plans for a Carriage-house and Stable; Elevation of Block of two Store-fronts; Designs for Street-fronts for Stores; Designs for four Stores; Design for a Frame School-house; Design for a Brick School-house with Mansard Roof; Design for a small Church; Design for a Chapel Church; Design for a Church; Design for a First-class Court House; Design for a Model Jail and Jailer's Residence.

Brown.—Five Hundred and Seven Mechanical Movements:

Embracing all those which are most important in Dynamics, Hydraulics, Hydrostatics, Pneumatics, Steam Engines, Mill aud other Gearing, Presses, Horology, and Miscellaneous Machiuery; and including many movements never before published, and several of which have only recently come into use. By HENRY T. BROWN, Editor of the "American Artisan." 1 vol. 12mo. $1 00

Blenkarn.—Practical Specifications of Works executed in Architecture, Civil and Mechanical Engineering, and in Road Making and Sewering:

To which are added a series of practically useful Agreements and Reports. By JOHN BLENKARN. Illustrated by fifteen large folding plates. 8vo. $9 00

Blinn.—A Practical Workshop Companion for Tin, Sheet-Iron, and Copper-plate Workers:

Containing Rules for describing various kinds of Patterns used by Tin, Sheet-Iron, and Copper-plate Workers; Practical Geometry; Mensuration

of Surfaces and Solids; Tables of the Weights of Metals, Lead Pipe, etc; Tables of Areas and Circumferences of Circles; Japan, Varnishes, Lackers, Cements, Compositions, etc. etc. By LEROY J. BLINN, Master Mechanic. With over One Hundred Illustrations. 12mo. . . $2 50

CONTENTS.—*Rules for Describing Patterns.*—An Envelope for a Cone; A Frustrum of a Cone; A Can top or Deck flange; A Pattern for, or an Envelope for a Frustrum of a Cone; A Tapering Oval Article to be in four Sections; A Tapering Oval Article to be in two Sections; A Tapering Oval Article; A Tapering Oval and Oblong Article, the sides to be Straight, with Quarter Circle corners, to be in two Sections; A Tapering Oval or Oblong Article, the sides to be Straight, one end to be a Semicircle, the other end to be Straight, with Quarter Circle corners, to be in two Sections; A Tapering Oval or Oblong Article, the Sides to be Straight, with Semicircle ends, to be in two Sections; Covering of Circular Roofs, Two different Principles; To cover a Dome by the first Method; To cover a Dome by the second Method; To ascertain the Outline of a Course of covering to a Dome, without reference to a Section of the Dome; To describe a Pattern for a Tapering Square Article; A Square Tapering Article to be in two Sections; A Tapering Article, the Base to be Square, and the Top a Circle, in two Sections; A Tapering Article, the Base to be a Rectangle, and the Top Square, in two Sections; A Tapering Article, the Base to be a Rectangle, and the Top a Circle, in two Sections; A Tapering Article, the Top and Base to be a Rectangle, in two Sections; Tapering Octagan Top or Cover; A Mitre Joint at Right Angles for a Semicircle Gutter; A Mitre Joint at any Angle for a Semicircle Gutter; A Mitre Joint for an O G Gutter at Right Angles; A Mitre Joint for an O G Cornice at Right Angles, also an Offset; An Octagon O G Lamp Top or Cover; A T Pipe at Right Angles; A T Pipe at any Angle; A T Pipe, the Collar to be smaller than the Main Pipe; A T Pipe at any Angle, the Collar to set on one side of the Main Pipe; A Pipe to fit a flat Surface at any Angle, as the Side of a Roof of a Building; A Pipe to fit two flat Surfaces, as the Roof of a Building; An Elbow at Right Angles; An Elbow Pattern at any Angle; An Elbow in three Sections; An Elbow in four Sections; An Elbow in five Sections; A Tapering Elbow; An Oval Boiler Cover; A Flange for a Pipe that goes on the Roof of a Building; Octagon or Square Top or Cover; Steamer Cover; An Ellipse or Oval, having two Diameters given; An Ellipse with the Rule and Compasses, the Transverse and Conjugate Diameters being given, that is, the Length and Width; To find the Centre and the two Arcs of an Ellipse; To find the Radius and Versed Sine for a given Frustrum of a Cone; Practical Geometry; Decimal Equivalents to Fractional Parts of Lineal Measurement; Definitions of Arithmetical Signs; Mensuration of Surfaces; Mensuration of Solids and Capacities of Bodies; Tables of Weights of Iron, Copper, and Lead; Tables of the Circumferences and Areas of Circles; Sizes and Capacity of Tinware in form of Frustrum of a Cone, such as Pans, Dish Kettles, Pails, Coffee-pots, Wash Bowls, Dippers, Measures, Druggists' and Liquor Dealers' Measures; American Lap Welded Iron Boiler Flues; Table of Effects upon Bodies by Heat; Weight of Water; Effects produced by Water in an Aeriform state; Practical Properties of Water; Effects produced by Water in its Natural State; Effects of Heat at certain Temperatures; Tempering; Effects produced by Air in its Natural and in a Rarefied State; Table of the Expansion of Atmospheric Air by Heat; Size, Length, Breadth, and Weight of Tin Plates; Crystallized Tin Plate; List of Calibre and Weights of Lead Pipe; Calibre and Weights of Fountain or Aqueduct Pipes; To ascertain the Weights of Pipes of various Metals, and any Diameter required; Weight of a Square Foot of Sheet Iron, Copper, and Brass, as per Birmingham Wire Gauge; Recapitulation of Weights of Various Substances. *Practical Receipts.*—Japanning and Varnishing; Varnishes; Miscellaneous; Lackers; Cements; Miscellaneous Receipts; Britannia; Solders, etc.; Strength of Materials.

Booth.—Marble Worker's Manual:

Containing Practical Information respecting Marbles in general, their Cutting, Working, and Polishing; Veneering of Marble; Mosaics; Composition and Use of Artificial Marble, Stuccos, Cements, Receipts, Secrets, etc. etc. Translated from the French by M. L. BOOTH. With an Appendix concerning American Marbles. 12mo., cloth . . . $1 50

CONTENTS.—Alabaster; American Marbles; Artificial Marble and Stuccos; Atelier of the Marble Worker; Breccias; Universal Cement; Chimney-piece in Malachite; Chinese Paintings, unalterable; Coloring of Marbles and Artificial Marbles; Crab Crane

Defects in Marbles; Designs; Varieties of Marbles; Figures in relief; Granite; Imitation of Marbles and Mosaics; Jack-screw; Jasper; Lapis; Mastics; Marbles in general; Ancient method of Painting Marbles. MARBLES—Coloring, Cleansing, Cutting, Working, Polishing, defects of; Different Varieties of; Modern; Machinery for raising; Machinery for Sawing and Moulding; Machinery for Sculpturing or reducing; Manner of Working Toy; Manufacture; Ornamental Working, workmanship of; Turned Marble; Veneering Marble. MOSAICS by absorption, imitations of; Ornamental Marble work; Porphyries and Granites; Pozzolana; Pumice Stone; Quartz; Various Recipes; The Sculpture; Sculpture by Acids; Serpentine; Setting up of Works; Composition of Slabs of Marble; Casting of Slabs; Tannage of Slabs; Stuccos and Artificial Marbles; Mouldings in Stuccos; Picture in Stuccos; Tackle. ZENACES—Venetian; Preparation of Area; Working of Marble for; Venetian less costly; Veneering upon Marble, Wood, and Stone; Vocabulary; Winch.

Booth and Morfit.—The Encyclopedia of Chemistry, Practical and Theoretical:

Embracing its application to the Arts, Metallurgy, Mineralogy, Geology, Medicine, and Pharmacy. By JAMES C. BOOTH, Melter and Refiner in the United States Mint, Professor of Applied Chemistry in the Franklin Institute, etc., assisted by CAMPBELL MORFIT, author of "Chemical Manipulations," etc. Seventh edition. Complete in one volume, royal 8vo., 978 pages, with numerous wood-cuts and other illustrations . . $5 00

Bowditch.—Analysis, Technical Valuation, Purification, and Use of Coal Gas:

By Rev. W. R. BOWDITCH. Illustrated with wood engravings. 8vo. $6 50

Box.—Practical Hydraulics:

A Series of Rules and Tables for the use of Engineers, etc. By THOMAS BOX. 12mo. $2 50

Box.—A Practical Treatise on Heat:

As applied to the Useful Arts; for the Use of Engineers, Architects, etc. By THOMAS BOX, author of "Practical Hydraulics." Illustrated by 14 plates containing 114 figures. 12mo. $4 25

CONTENTS.—CHAPTER I.—General Principles and Facts in the Theory of Heat. II.—On Combustion. III.—On Steam-boilers. IV.—On the Efflux of Air, etc. V.—On Chimneys. VI.—On Vapor. VII.—On Evaporation. VIII.—On Distillation. IX.—On Drying. X.—On Heating Liquids. XI.—On Heating Air. XII.—On the Transmission of Heat and Laws of Cooling. XIII.—Laws of Cooling at High Temperatures. XIV.—On the Transmission of Heat by Conduction. XV.—On Ventilation, etc. XVI.—Examples of Heating and Ventilation. XVII.—On Wind, and its Effects on Ventilation, etc.

Bell.—Chemical Phenomena of Iron Smelting:

An Experimental and Practical Examination of the Circumstances which determine the Capacity of the Blast Furnace, the Temperature of the Air, and the proper Condition of the Materials to be operated upon. By I. LOWTHIAN BELL. Illustrated. 8vo. $6 00

CONTENTS. SECTION I.—Introduction. II.—Formation of Carbonic Oxide in the Blast Furnace. III.—Action of Carbonic Oxide on Iron Ore in the Blast Furnace. IV.—Experiments to Ascertain the Temperature at which Carbonic Oxide commences to act on Oxide of Iron. V.—Behavior of Oxide of Iron in contact with Carbonic Oxide at a Red Heat. VI.—Action of Carbonic Oxide on Metallic Iron. VII.—Action of Mixtures of Carbonic Oxide and Carbonic Acid on Iron. VIII.—Action of Mixtures of Carbonic Oxide and Carbonic Acid on Oxide of Iron. IX.—Action of Gases of Blast Furnace on Oxide of Iron. X.—Reducing Effects of Gases at different depths of the Blast Furnace. XI.—Dissociation of Carbonic Oxide in the Blast Furnace. XII.—Circumstances which limit Carbon Deposition. XIII.—Carbon Deposition as effected by Blast Furnace Gases. XIV.—Change experienced by Metallic Iron, and by Iron Oxides, which have served to dissociate Carbonic Oxide. XV.—Probable Nature of Change in Carbonic Oxide and Iron Oxides in the Dissociation of Carbonic Oxide. XVI.—Heat Alone does not suffice for Dissociating Carbonic Oxide in the Blast Furnace. XVII.—Effect of certain Metallic Substances, besides Iron, on Carbonic Oxide, including Silicon. XVIII.—Summary of Action of Carbonic Oxide and Carbonic Acid on Metals and their Oxides, including Silicon. XIX.—Deposited Carbon; the supposed partial Cause of certain apparent Anomalies in the Composition of Blast Furnace Gases. XX.—Office performed by Deposited Carbon. XXI.—Generation and Behavior of Carbonic Acid in the Blast Furnace. XXII.—On Hydrogen; its Source, and possible Influence in the Blast Furnace. XXIII.—On Ammonia in the Blast Furnace. XXIV.—On Hydro-Carbons in the Blast Furnace. XXV.—On the presence of the Metallic Bases of the fixed Alkalies in the Gases of the Blast Furnace. XXVI.—On the presence of Alkaline Cyanides in the Blast Furnace. XXVII.—Fume emitted by the Blast Furnace. XXVIII.—Estimate of the quantity of Heat required in the Process of Iron Smelting. XXIX.—Respecting the Modes employed to ascertain the Heat Absorption of each Stage of the Operation. XXX.—On the Origin of the Heat Produced in the Blast Furnace. XXXI.—On the Extent to which the Heat produced by the Combustion of Coke can be replaced by that contained in the Blast. XXXII.—On the Capacity required by the Blast Furnace to avoid unnecessary Loss from the presence of Sensible Heat in the Escaping Gases. XXXIII.—On the Capacity required by the Blast Furnace to enable the Carbonic Oxide to become saturated with Oxygen. XXXIV.—On the Progressive Changes experienced by the Minerals during their Descent in the Blast Furnace. XXXV.—On the Behavior of Phosphorus and Sulphur in the Blast Furnace. XXXVI.—On some of the Conditions which apparently affect the Quality of the Iron. XXXVII.—On some of the Modifications of the Action of the Blast Furnace arising from Changes in its Dimensions. XXXVIII.—On the proper Condition of the Materials to be operated upon in the Blast Furnace. XXXIX.—On the Theory of the Hot Blast. XL.—On the Effect of the Hot Blast on the Quality of the Iron. XLI.—On the Theoretical Minimum of Fuel required to produce one ton of Pig Iron. XLII.—Supplementary Remarks on the Action of the Blast Furnace, in Connection with its Dimensions, and the Use of Super-heated Air. XLIII.—On the Smelting of certain Ores by means of Charcoal. XLIV.—Supplementary Remarks on Carbon Impregnation by Dissociation of Carbonic Oxide. XLV.—Conclusion. Note to Section XIV.

Buckmaster.—The Elements of Mechanical Physics:

By J. C. BUCKMASTER, late Student in the Government School of Mines; Certified Teacher of Science by the Department of Science and Art; Examiner in Chemistry and Physics in the Royal College of Preceptors; and late Lecturer in Chemistry and Physics of the Royal Polytechnic Institute. Illustrated with numerous engravings. In one vol., 12mo. $1 50

CONTENTS.—*The Elements of Mechanical Physics.* CHAP. I.—Statics and Dynamics; Force; Gravitation and Weight; On Matter—its Mass, Density, and Volume. II.—Centre of Gravity; Stable and Unstable Equilibrium; To find the Centre of Gravity of a Material Straight Line of Uniform Density; To find the Centre of Gravity of two

heavy Points joined by a rigid bar without Weight; To find the Centre of Gravity of a number of heavy points; To find the Centre of Gravity of a Material Plain Triangle. III.—Levers; Levers are of three kinds; Virtual Velocity; Balances; The Safety Valve; Mechanical Combinations and their Advantages. IV.—The Wheel and Axle; The Compound Wheel and Axle. V.—The Pulley; Wheels and Pinions; Cranks and Fly-Wheel. VI.—The Inclined Plane; The Wedge; The Screw. VII.—Composition and Resolution of Forces. VIII.—Falling Bodies; Ascent of Bodies; Projection of Bodies Horizontally. IX.—Momentum. X.—Sound; The Pendulum.

Elements of Hydrostatics.—CHAP. I.—Hydrostatics; Bramah Hydrostatic Press. II.—Specific Gravity; Table of Specific Gravities. III.—Elastic Fluids; The Air Pump and its Operation; The Construction of the Condenser and its Operation; The Barometer; The Action of the Siphon; How to Graduate a common Thermometer; To Reduce the Degrees of a Thermometer in Fahrenheit's scale to a centigrade and the converse; The Construction of a Siphon gauge; The Construction of a common Pump and its Operation; The Construction and Operation of a Force Pump; The Operation of a Fire Engine; The Operation of a Lifting Pump; The Hydraulic Ram; The Archimedian Screw; The Chain Pump; Mercurial Steam Gauge; Examination Papers.

APPENDIX.—Examples; Answers to Examples.

Bullock.—The American Cottage Builder:

A Series of Designs, Plans, and Specifications, from $200 to $20,000, for Homes for the People; together with Warming, Ventilation, Drainage, Painting, and Landscape Gardening. By JOHN BULLOCK, Architect, Civil Engineer, Mechanician, and Editor of "The Rudiments of Architecture and Building," etc. etc. Illustrated by 75 engravings. In one vol. 8vo.

$3 50

CONTENTS.—Chap. I.—*Generally.* Where to bnild a cottage—Bird cottage—Objects Desired. II.—*The Various Parts.*—Walls—Cob walls—Mud walls—Silverlock's hollow walls—Dearnes' hollow brick walls—Loudon's hollow brick walls—Flint built walls—Walls of framed timber, rubble, and plaster—Walls of hollow bricks—Covering for external walls—Inside work—Floors—Lime-ash floors—Concrete floors—Plaster floor—Asphalte—Floor of hollow pots—Tile floor—Floors of arched brickwork in mortar—Fireproof floor—Tile-trimmer—Girder floor—Stairs formed of tile—Roofs—Thatch—Tile for roofing—Slate roof—Cast-iron roofing—Eaves-gutter—Chimney-shaft—Ventilation and warming. III.—*Terra del Fuego Cottage.* IV.—*Prairie Cottage*—Cottage of unburnt brick, plan—Cross section—Side view—Manner of laying the brick and the fonndation—Chimney-cap, perspective, and top views. *The Farm Cottage*—Ground floor—Attic floor. VI.—*The Village Cottage.* VII.—*Italian Cottage.* VIII.—*Thatched Cottage.* IX.—*Cottage of the Society for Improving the Condition of the Poor.* X.—*Warming and Ventilation*—Ventilation. XI.—*Model Cottage*—Hollow brickwork. XII.—*Rural Cottage*—Basement plan—Plan of the first floor—Plan of the second floor. XIII.—*Octagon Cottage*—Plan of basement—Plan of principal story. XIV.—*Drainage.* XV.—*Rural Homes*—Circumstances to be taken into consideration in the choice of a situation—Elevation—The character of the surface on which to build—Aspect—Soil and subsoil—Water—Villa—Rural home, No. 1—Views of a suburban residence in the English style—Rural home, No. 2—Rural home, No. 3—Rural home, No. 4. XVI.—*Paint and Color.* XVII.—*Suburban Residences*—Gothic suburban cottage of C. Prescott, Esq., Troy, N. Y.—Basement—First floor—Attic—Second floor; Suburban octagonal cottage. XVIII.—*Landscape Gardening*—First steps in forming a landscape garden—The roads and paths—Trees, shrubs, and planting—Hills and mounds—Valleys and low grounds—Rockwork—Of water, and its appropriation or adoption—Fountains—General observations—Formal gardening—Pleasure grounds and flower gardens—The flower garden—The greenhouse—The conservatory. XIX.—*Cost*—The Terra del Fuegan cottage—The prairie cottage—The village cottage—The Italian cottage—The thatched cottage—The cottage of the Society for Improving the Condition of the Poor—Prince Albert's model cottage—The rural cottage—Mr. Fowler's octagonal cottage—Rural home, No. 1—Rural home, No. 2—Rural home, No. 3—The suburban residence—The octagonal suburban residence designed by Wilcox—The Byzantine cottage—The Gothic suburban residence designed by Mr. Davis. XX.—*Two Residences*—The Byzantine cottage—Ground plan—Plan of second story—The Gothic suburban residence of W. H. C. Waddell, Esq., New York—First floor—Second floor. XXI.—*Artist's and Artisan's Calling.*

Bullock.—The Rudiments of Architecture and Building:

For the use of Architects, Builders, Draughtsmen, Machinists, Engineers, and Mechanics. Edited by JOHN BULLOCK, author of "The American Cottage Builder." Illustrated by 250 Engravings. In one volume 8vo.

$3 50

CONTENTS.—BOOK I. THE ORDERS.—Doric Order—Modern Doric—Tuscan Order—Ionic Order—Ionic Antæ—Ionic Entablature—Roman and Modern Doric—Entablature—Corinthian Order—Composite Order—Columniation—Intercolumniation.

BOOK II. Sketches of the History and Description of the Styles of Architecture of Various Countries from the Earliest to the Present Time. CHAP. I. Architecture of Various Countries—Nineveh, Babylon, and Egypt. II. Grecian Architecture. III. Roman Architecture. IV. Byzantine and Romanesque. V. The Architecture of Germany, France, and Normandy. VI. Syrian, Persian, and Persepolitan Architecture. VII. The Ancient Architecture of India. VIII. Chinese Architecture. IX. Arabian, Saracenic, or Moorish Architecture. X. Druidical, Celtic, and Anglo-Roman Architecture. XI. Architecture of England.

BOOK III. CHAP. I. Definition of Architecture—Its Necessity, Uses, and Requirements. II. Ocular and Formal Beauty—First Generalization thereon—Unity and Variety—Graduation and Contrast. III. Different Kinds of Beauty, of Sublimity, and of Picturesqueness—their Characteristics. IV. Imitation of Nature and of Models—False Imitation—Constructive Truth—Constructive Unity—Three Systems thereof. V. Application of the foregoing Principles to Trabeated or Beamed Building by the Grecian Architects. VI. Application of the same Principles to Compressile Building by the Mediæval Architects—Of Arch or Vault Work as the fundamental principle of the Gothic system—On the General Plans—Post Gothic Architecture—Concluding Remarks—Ancient Monuments of Greece—Glossary.

RUDIMENTS OF THE ART OF BUILDING. SECTION I. General Principles of Construction. Foundations—Natural Foundations—Artificial Foundations—Foundations in Water—Foundations formed wholly of Piles—Solid Foundations simply laid on the surface of the Ground—Pierre Perdue—Coursed Masonry—Beton—Caissons—Solid Foundations laid in Cofferdams—Beton—Pile-driving—Cofferdams—Retaining Walls—Amount and Direction of the Thrust—Calculation of Minimum Thrust—Resistance of the Wall—Counterforts—Breast Walls—Arches—Brick Arches—Skew Arches—Centering—Abutments—Wing Walls—Vaulting—Masonry; Brickwork; Bond—Uniformity of Construction—Bond—Distribution of the Load—Partitions—Floors—Roofing—Trussed Roofs, exerting no Side Thrust on the Walls—Roofs on the Principle of the Arch—Gothic Roofs—Roof Coverings—Tiles—Metallic Coverings—Supply of Water—Warming and Ventilation—Methods of Warming independently of Ventilation—Methods of Warming combined with Ventilation. II. Materials used in Building. Lumber—Decay of Lumber—Prevention of Decay. Limes and Cement. Mortar, etc.—Pure Limes—Water Limes—Dorking Lime—Blue Lias Limes—Water Cements—Concrete and Beton. Metals. Iron—Cast Iron—Lead—Cast Lead—Copper—Zinc—Brass—Bronze—Bell Metal. Stone—Slate—Sandstones—Limestones—Slate—Glass—Bricks and Tiles. III. Strength of Materials. Resistance to Compression—Resistance to Tension—Strength of Beams—Cross Strain—Mechanical Effect of a given Load under varying Circumstances—Resistance of the Beam—Trussed Timber Beams—Strength of Story-posts and Cast-iron Pillars. IV. Use of Materials. Excavator—Bricklayer—Mason—Carpenter—Joiner—Slater—Table of Sizes of Roofing Slates—Slates—Plasterer—Memoranda—Smith and Iron-founder—Plumber—Table of the Weight of Lead Pipes per yard—Zinc Worker—Glazier—Painter. Paperhanger, and Decorator—Drainage—Paints. V. Making Drawings, Specifications, Estimates, and Contracts. Plan of Site—Levels—Working Drawings—Block Plans—General Drawings—Detailed Drawings—Specification—Conditions of Contract—The Description of the Works—Bills of Quantities.

APPENDIX. Woods of North America—Weight of Stone—Weight of Timber—Wages—Weight of Earth—Tiling—Mortar.

Burgh.—Practical Illustrations of Land and Marine Engines:

Showing in detail the Modern Improvements of High and Low Pressure, Surface Condensation, and Super-heating, together with Land and Marine Boilers. By N. P. BURGH, Engineer. Illustrated by twenty plates, double elephant folio, with text $21 00

Burgh.—Practical Rules for the Proportions of Modern Engines and Boilers for Land and Marine Purposes.

By N. P. BURGH, Engineer. 12mo. $1 50

CONTENTS.—High Pressure Engines; Beam Engines (condensing); Marine Screw Engines; Oscillating Engines; Valves, etc.; Land and Marine Boilers. *Miscellaneous.*—Coal Bunkers, Marine; Decimals, etc.; Eccentric, Position of, for Land Engines; Eccentric, Position of, for Marine Screw Engines; Fire Bars; Keys and Cotters; Link for Land Engine, Radius of; Levers; Link for Oscillating Engine, Radius of; Link for Marine Screw Engine, Radius of; Proportion of Connecting Rods having Strap Ends; Paddle Wheels, Centres of Radius Rods; Plummer Blocks; Proportions of Steam Cocks with Plugs secured by Nuts and Screws; Proportion of Marine Cocks; Proportions of Bolts, Nuts, etc.; Proportions of Pins, Studs, Flanges, etc.; Proportions of Copper Pipes; Proportions of Engines; Sliding Quadrant; Toothed Wheels (Gearing). *Proportions of Engines Produced by the Rules.*— Proportions of an Engine 20 H P nominal; Proportions of a Condensing Beam Engine 150 H P nominal; Proportions of a Pair of Marine Engines of 200 H P collectively; Proportions of a Pair of Oscillating Engines of 400 H P collectively; Proportions of Boilers.

Burgh.—The Slide-Valve Practically Considered:

By N. P. BURGH, author of "A Treatise on Sugar Machinery," "Practical Illustrations of Land and Marine Engines," "A Pocket-Book of Practical Rules for Designing Land and Marine Engines, Boilers," etc. etc. etc. Completely illustrated. 12mo. $2 00

CONTENTS.—CHAPTER I.—Antecedents of the Slide-Valve and Steam Ports in the Cyliuder. II.—The Proportion of Valves and Ports in the Cylinder; Common and Exhaust Relief Slide-Valves. III.—Equilibrium and Double-Ported Valves. IV.—The Proper Mode of Obtaining the Correct Amount of Lap. V.—The Effect of Expansion by the Action of the Slide-Valve. VI.—The Delineation of the Path of the Crank-Pin. VII.—General Observations.

☞ The author has carefully avoided theorizing on the subject on which he treats; all his remarks have been deduced from *practical* demonstrations—assumptions have *not* been admitted—therefore the data given will be found correct.

Byrn.—The Complete Practical Brewer:

Or Plain, Accurate, and Thorough Instructions in the Art of Brewing Beer, Ale, Porter, including the Process of making Bavarian Beer, all the Small Beers, such as Root-beer, Ginger-pop, Sarsaparilla-beer, Mead, Spruce Beer, etc. etc. Adapted to the use of Public Brewers and Private Families. By M. LA FAYETTE BYRN, M. D. With illustrations. 12mo. $1 25

CONTENTS.—Grain used for Brewing; Malting; Brewing Ale and Beer, Plan, Machinery and Utensils of a great Brewery; Practical Process of Brewing; Scotch System of Brewing Ale; Mashing; Boiling the Worts; Cooling the Worts; Fermentation; Cleansing; English System of Brewing Ale; Mashing; Boiling the Worts; Cooling; Fermentation; Cleansing; Brewing of Porter; Mashing; Boiling; Cooling; Fermentation; Cleansing Ale; Brewing on a small scale, suitable for Brewers in the Interior; Ale made by Private Families; Ale Brewed by Families of Distinction in England; Small Beers; Brewing of Cider; Gathering the Fruit; Grinding the Fruit; Pressing the Ground Fruit; Fermentation; Racking and Cleansing: Bottling; Cider Casks; Burton Ale; Windsor Ale; Bavarian Beer; Table Beer from Bran and Shorts; Ginger Wine; Substitute for Brewer's Yeast; Currant Wine; Small Beer for Shipping; Welsh Ale; Reading Ale; Wirtemberg Ale; Hock; Scurvy-Grass Ale; Dorchester Ale; Bottling Beer; Filtering Operation; Cultivation of Hops.

Byrn.—The Complete Practical Distiller:

Comprising the most perfect and exact Theoretical and Practical Description of the Art of Distillation and Rectification; including all of the most recent improvements in distilling apparatus; instructions for preparing spirits from the numerous vegetables, fruits, etc.; directions for the distillation and preparation of all kinds of brandies and other spirits, spirituous and other compounds, etc. etc. By M. LA FAYETTE BYRN, M.D. Eighth Edition. To which are added, Practical Directions for Distilling, from the French of Th. Fling, Brewer and Distiller. 12mo. . $1 50

CONTENTS.—Description of a Distillery; Some Directions to the Distiller; Of Distillation and the Apparatuses made use of; Continuous Distillation; Mode of Working the Apparatus; Apparatus used principally in American and English Distilleries; Instrument to Prevent Inequality of Heat in Distillation; Of the Process of Malting, etc.; French Method; English Method; Fermentation; Rectification; Common Process of Malt Distilling; French Process of Distilling and Preparing Brandy; Method of Preventing the Deterioration of Brandies; Malt Whiskey; Process for Making Dutch Geneva; Process for Brewing Hollands Gin; Process for Rectification into Hollands Gin; Distillation of Common Gin; Spirit of Potatoes; Apparatus made use of in the Distillation of Potato Spirit; Reduction of Potatoes; Mashing of Potatoes; Rasping Potatoes; Separation of the Fecula; Draining; Arrack, or Spirits of Rice; Spirits of Beet Roots; The Beet Rasp; Kirsch Wasser, or Spirits of Cherries; Of some of the Products of this Country which afford Spirits by Distillation; Cider Spirits, or Apple Brandy; Peach Brandy; Of the Preparation and Distillation of Rum; Process made use of in Great Britain and Ireland for fermenting and Distilling Molasses; Raisin Spirits; Flavoring and Coloring of Spirits; Process for Making Rum Shrub; Process for Making Brandy Shrub; Elder Juice; Method of Making Cherry Brandy; Eau de Luce; Usquebaugh; Process of Making Nectar; Imperial Ratafia; Method of Making Lovage Cordial; Process of Making Citron Cordial; Cinnamon Cordial; French Noyau; Peppermint Cordial; Process of Making Aniseed Cordial; Method of Making Caraway Cordial; French Vinegar; Method of Making English Vinegar; Some General Directions for the Distillation of Simple Waters, etc.; Of the Stills used for Simple Waters; Cinnamon Water; Peppermint Water; Damask-rose Water; Orange-flower Water; Orange Wine; Simple Lavender Water; Compound Lavender Water; Hungary Water; Some General Directions for the Distillation of Spirituous Waters; Jessamine Water; Eau de Beaute; Some Remarks on the Uses of Feints, and their General Character; Rules for Determining the Relative Value and Strength of Spirits; Observations on Distillation of a Special Character, and on the Selection of Apparatus most useful; Remarks on an Instrument intended for Testing Wines; Some General Directions for the Preparation of various Cordials, Compounds, etc.; On some of the Plans resorted to for the purpose of Adulterating Brandy; Process for Making Lime Water; Process of Making Sulphuric Ether; Instructions for Making Infusions, Spirituous Tinctures, etc., Tonic and Alterative Cordial; Aromatic Bitters; Process for Making a Diuretic and Stomachic Compound; Process for Making Tincture of Musk.

APPENDIX.—Practical Directions for Distilling by Th. Fling. INDEX.

Byrne.—Handbook for the Artisan, Mechanic, and Engineer:

Comprising the Grinding and Sharpening of Cutting Tools, Abrasive Processes, Lapidary Work, Gem and Glass Engraving, Varnishing and Lackering, Apparatus, Materials and Processes for Grinding and Polishing, &c. By OLIVER BYRNE. Illustrated by 185 wood engravings. One vol. 8vo. $5 00

CONTENTS.—GRINDING AND SHARPENING CUTTING TOOLS:—GRINDING CUTTING TOOLS ON THE ORDINARY GRINDSTONE—Importance of the grindstone—Various arrangements of frames for grindstones driven by handles and treadles—Grinding and polishing lathe for amateurs—General remarks on grinding tools—Examples: Grinding carpenters' bench plane irons, chisels, gouges, and moulding-plane irons—Turners' chisels and gouges—flat, side, triangular, and square tools—Gravers, drills, and point tools—Round and heel tools—Slide rest tools and cutters.

SHARPENING CUTTING TOOLS ON THE OILSTONE.—General remarks on oilstones, and angles at which the tools are held—Examples: Carpenters' tools, bench plane irons, chisels, gouges, and moulding-plane irons—Turners' chisels, gouges, flat, moulding, and other tools for wood, ivory, and brass.

SETTING RAZORS.—Proportions and sections of razors, various modes in which they are ground—Tests for keenness of edge—Faulty conditions of razors—Whetstones usually employed—Setting edge of razors—Razor-strops.

SHARPENING CUTTING TOOLS WITH ARTIFICIAL GRINDERS—Horizontal grinding machine—Guides for grinding tools to definite angles—Instrument for grinding and setting ordinary turning tools—Instrument for setting rose-engine tools—Instrument for sharpening straight and angular tools for ornamental turning—Vertical lap, mounted on lathe, for setting tools—Sharpening tools with concave edges—Conical grinders for bead tools and drills—Sharpening ornamental drills and cutters—Sharpening moulding tools, figured punches, &c.—Instrument for setting the edges of pen-knives, razors, and surgical instruments.

GRINDSTONES, THEIR ACTUAL AND POSSIBLE USES.

THE FIGURATION OF MATERIALS BY ABRASION.—THE PRODUCTION OF PLANE SURFACES BY ABRASION.—General remarks: Principal dependence for accuracy of form placed upon that of the abrasive tool, or on the relative motions of the grinder and work—Revolving laps for flat works in metal—Lapping flat surfaces—Cutting facets on steel jewelry, faceting gold and silver works—Watch-makers' Geneva tool for polishing flat heads of small screws—Grinding large flat works in metal—Machine for flat surfaces—General methods pursued in the figuration of materials by abrasion, illustrated by the modes of working stone and marble—Saws for soft stone—Saws for hard stone and marble—Setting out and sawing blocks of marble and slabs—Grub-saws for narrow slips and small works—Grinding and polishing plane and figured surfaces by hand; inlaid works—Application of machinery to working marble—Machine for large blocks—Sawing machine for slabs—Circular sawing machine for narrow slips—Sawing circular works—Revolving laps for grinding plane surfaces—Grinding machine for large slabs—Machine for working mouldings—Polishing machine—Manufacture of plate-glass—Grinding machines—Smoothing by hand—Polishing machines—Manufacture of sheet-glass—Grinding and polishing machines—Grinding accurate plane surfaces, illustrated by methods pursued for optical purposes—Grinding parallel disks of glass for sextants—Plane specula.

THE PRODUCTION OF CYLINDRICAL SURFACES BY ABRASION.—Grinding external cylindrical surfaces in metal—Clamps used by hand, or in the lathe, for rods, lathe mandrels, gauges, rollers, &c.—Fixed and revolving grinders, mounted in the lathe for accurate works—Grinding accurate cylindrical rollers for paper-making with water only—Grinding cylindrical rims of pulleys—Grinding internal cylindrical surfaces—Solid and expanding grinders for cylindrical holes—Fitting together external and internal cylinders.

THE PRODUCTION OF CONICAL SURFACES BY ABRASION.—Grinding external conical surfaces in metal; grinders similar to these employed for cylinders—Clamps for short cones, lathe mandrels, &c.—Fixed and revolving grinders—Grinding conical holes—Solid and spring grinders for axletree-boxes, collars for lathe mandrels, &c.

THE PRODUCTION OF SPHERICAL SURFACES BY ABRASION.—Method of grinding accu-

rate spheres in hardened steel, glass, &c.; one of the most unexceptinable examples of the production of form by abrasion—Grinding spherical surfaces for lenses—Formation of the grinding tools—Motions given to the tool; correction of curvature—Preparation of the glass—Rough and smooth grinding—Polishing lenses—Cloth polisher for lenses of ordinary accuracy—Grinding the edges circular—Varley's lathe for grinding and polishing lenses and specula—Machinery for grinding common lenses—Grinding and polishing best lenses for object glasses—Silk polisher—Accuracy of radius of curvature; Ross's spherometer—Grinding and polishing lenses for microscopes—Grinding and polishing specula for reflecting telescopes—Small specula ground and polished by hand—Rough grinding with emery, smoothing with bed of hones; polishing tools—Preparation of pitch polisher—Manipulation and source of error in the hand process—the Earl of Rosse's machine for grinding and polishing three-foot speculum—Management of the resinous composition for the polisher—Modifications adopted in grinding and polishing the six-foot speculum—Methods of supporting specula in telescopes, and while being figured—Machine for polishing specula—Machine for grinding and polishing specula and lenses—Temporary apparatus for polishing small specula—Grinding machines for spherical stoppers of air-tight jars.

Glass Cutting.—Glass-cutters' wheels, mills, and polishers—Rough grinding flutes, splits, and pillars, on iron wheels fed with sand—Smooth-grinding on fine grit stones—Polishing on willow wheels, and wheel brushes—Fitting stoppers into glass bottles—Cutting glass drops.

Lapidary Work.—Slitting, Cutting, and Polishing Flat and Rounded Works.—General remarks on various apparatus—Ordinary lapidaries' bench, gim-peg, slitting mill—Mortars for crushing and grinding diamond powder—Charging the slicer—Slicing gems and small stones—Crane for slicing large stones—Flatting mill; rough and smooth grinding flat surfaces—Cutting the edges of stones to definite forms—Cutting convex surfaces—Cutting concave surfaces and mouldings—Cutting seal handles—Drilling large and small holes.

Cutting Facets.—Different forms of faceting—Preparation of stones for receiving facets—Faceting trap for square cut stone—Brilliant cut—Half brilliant cut—Full brilliant cut—Trap brilliant cut—Double brilliant or Lisbon cut—Rose cut—Star cut, and dental cut—Geneva tool for faceting—Fictitious gems—Action of heat on carnelian, &c.—Pastes.—Metallic foils—Painted stones and doublets.

Lapidary Apparatus for Amateurs.—Driven by foot-wheel and treadle—Crane for slicing small or large stones—Apparatus for cutting facets mechanically—Table of settings for the instrument—Application to faceting.

Gem and Glass Engraving.—Introduction—Seal and Gem Engraving.—Seal engraver's engine—Preparation of tools, or small grinding wheels of different forms—Charging the tools with diamond powder—Preparing the stones—Engraving shields with quarterings—Color lines—Succession of the tools in gem and seal engraving—Position of the hands—Cutting curved lines—Sinking flat surfaces—Position of the stone—Difficulties of manipulation—On the comparative abilities of gem engravers—Polishing engraved surfaces—Qualities of different stones—Taking proof impressions of seals.

Cameo Cutting.—Effected by the same general methods and tools as those employed in engraving in intaglio—Selection of the stones—Onyx, gem engraver's application of the term—Adaptation of the design to the stone—Succession of the processes—Spade for smoothing.

Glass Engraving.—Effected in the same general manner as seal engraving, but with larger apparatus—Glass engraver's tool and wheels—Engraving works of different kinds.

Varnishing and Lackering.—Preparation of the Varnishes.—General qualities of the resins commonly used in making varnishes—Animè, amber, copal, lac, sandarac, mastic, damar, and common resin—Vehicles for varnishes—Clarifying and boiling linseed oil—Oil of turpentine—Alcohol, common tests for strength, and methods of concentrating—Preparation of oil varnishes—Apparatus employed in making small quantities—General routine of the process—Fine copal varnishes—Cabinet, carriage, and wainscot varnishes—Amber varnish—Preparation of spirit and turpentine varnishes, with and without the employment of heat—White and brown hard spirit varnishes—Hardwood lacker—French polish—Bleaching lac varnishes—Lackers for brass—Methods of coloring—Mastic and turpentine varnishes—Crystal, paper, water, sealingwax, and black varnishes.

Application of Varnishes—Spirit varnishing—Necessity of dry and warm atmosphere Varnishing flat surfaces—Polishing and painting varnished works—Japanning black, brown, and ornamented works—Lackering brass, &c.—Methods of heating—Lackering flat works—Management of the brush—Lackering circular works in the lathe—Dipping and bronzing ornamental brass works—Lackering or polishing hard-

wood turned works—French polishing—Indian varnishes for Burmese ware, palanquins, and furniture.

General Remarks upon Abrasive Processes.—Comparison of abrasive and cutting processes.

Preliminary Observations on Grinding and Polishing.—First, on the substances that are to be ground and polished — Secondly, on the materials, or abrasive powders, by the successive employment of which different substances are polished — Thirdly, on the tools or apparatus by the agency of which abrasive substances are applied to the objects to be ground and polished.

Dictionary of the Apparatus, Materials, and Processes for Grinding and Polishing, commonly employed in the Mechanical and Useful Arts—including bobs, bouldering stones, brushes—Buff leather; polishers, sticks, and wheels—Burnishers of various kinds—Caps—Cloth; polishers, rubbers, and wheels—Emery; cake, cloth, paper, powders, sticks, and wheels — Glass paper, glazers — Leather; polishers, rubbers, and wheels—Mills—Moslings; oilstones—Polishers and rubbers of various forms and materials—Rumble or shaking machine—Skive—Slicer—Wheels of natural stone, as grindstones; different methods of mounting these; driven by manual and steam power; hacking, jarring, roving, straggling, and turning grindstones, to keep them in order; general methods of application to works of large and small size; dry and wet stones—Wheels, of factitious stone, or composition wheels, of crocus, corundum, and emery—Wheels of metal, or metallic laps—Construction and applications of those used by cutlers, diamond polishers, engineers, glass-grinders, lapidaries, and mechanists generally—Wheels of wood or glaze wheels, used by cutlers, glass-cutters, and lapidaries—Wheels of leather, or buff wheels, glaziers, and polishers; general construction, action, and application, for polishing cutlery, lapidary, and metal works—Wheels of cloth, for ivory workers, lapidaries, &c. — Wheels of bristles or wire, for curved, chased, and pierced works.

Preparation and application of grinding and polishing materials — Chalk, charcoal, corundum, diamond, Dutch rush, emery, fish-skin — Flanders brick, flint, gannister stone, glass, gritstones, and hone slates of various kinds—Lime, loam, oilstone, oxides of iron, lead, and tin—Pumice-stone, putty-powder, rotten-stone, sand, sawdust, Tripoli, and whiting.

General methods of grinding and polishing—Albata—Brass; cast, filed, stamped, and turned works—Britannia and bronze metals—Braziers' and coppersmiths' works—Cutlery and edge tools; best and ordinary—Electrum, enamels, fluor-spar, glass, gold, and granite—Horn, ivory, and bone; curved, flat, and turned works—Lapidary works, general routine illustrated by the three different modes of cutting, grinding, and polishing alabaster, carnelian, and sapphire—Lists of materials treated in a similar manner, with remarks upon the peculiarities of working all the principal substances employed by the lapidary—Polishing litbographic stones—Machinery, large and small; flat and turned works, in iron and steel — Marble; flat, ornamented, sculptured, and turned works — Marquetry works in wood and metal — Mineral substances, painted works, porphyry, platinum, and scagliola — Shells, nacreous and porcelaneous — Carving shell cameos — Polishing silversmiths' works—Slate, tortoise-shell, and varnished works—Whalebone—Woods; hard and soft, flat and turned—Wrought iron and zinc

Byrne.—Pocket Book for Railroad and Civil Engineers:

Containing New, Exact, and Concise Methods for Laying out Railroad Curves, Switches, Frog Angles, and Crossings; the Staking out of work; Levelling; the Calculation of Cuttings; Embankments; Earth-work, etc. By Oliver Byrne. 18mo., full bound, pocket-book form . $1 75

Bourne.—Recent Improvements in the Steam-Engine:

In its various applications to Mines, Mills, Steam Navigation, Railways, and Agriculture. Being a supplement to the "Catechism of the Steam-Engine." By John Bourne, C.E. New Edition. With numerous Illustrations. 16mo. Cloth $1 50

Byrne.—The Practical Model Calculator:

For the Engineer, Mechanic, Manufacturer of Engine Work, Naval Architect, Miner, and Millwright. By OLIVER BYRNE. 1 volume, 8vo., nearly 600 pages $4 50

AMONG THE CONTENTS will be found:—Weights and Measures; of Time, Arithmetic, Notation, and Numeration; Rule of Three; Compound Proportion; of Common Fractions; Decimal Fractions, Duodecimals, Involution, Evolution; of Ratios, Proportions and Progressions, Fellowship or Partnership, Simple Interest, Positive Mensuration of Superficies; Tables of Decimal Equivalents to Fractional Parts of Lineal Measure; Table of Circumferences, Squares, Cubes, and Areas of Circles, from 1 to 100, advancing by a tenth; Table of Length to Circular Arcs; Table of Areas of Segments and Zones of a Circle; Table of Proportions of the Lengths of Circular Arcs; Table of Proportions of the Lengths of Semi-Elliptic Arcs; Table of Reciprocals of Numbers, Mensuration of Solids, etc.; Cuttings and Embankments; Table of Squares, Cubes, Square and Cube Roots of Numbers; Table of the Fourth and Fifth Powers of Numbers; Table of Hyperbolic Logarithms; the Steam Engine; Dimensions of Parts of Locomotives; Table of Pressure of Steam, in inches, of Mercury at Different Temperatures; Table of the Temperature of Steam at Different Pressures in Atmosphere; Table of Expansion of Air by Heat; Safety Valves; Parallel Motion; Tables of Nominal Horse-Power, etc.; Weight combined with Mass Velocity; Force and Work Done; Strength of Materials; Hydraulics; Water Wheels; Windmills; the Application of Logarithms; Trigonometry; of Heights and Distances; Spherical Trigonometry; Measurement of Angles, Gravity, Weight, Mass, Specific Gravity; Moment of Inertia, Weight, Acceleration, and Mass; Principles and Practical Applications of Mechanical Powers; Continuous Circular Motion; Velocity of Wheels, Drums, Pullies, etc.; Maximum Velocity and Power of Water Wheels; Pumps and Pumping Engines; Centripetal and Centrifugal Force; Ship-Building and Naval Architecture, with Numerous and very full Tables of Logarithms, etc.

Byrne.—The Practical Metal-Worker's Assistant:

Comprising Metallurgic Chemistry; the Arts of Working all Metals and Alloys; Forging of Iron and Steel; Hardening and Tempering; Melting and Mixing; Casting and Founding; Works in Sheet Metal; the Processes Dependent on the Ductility of the Metals; Soldering; and the most Improved Processes and Tools employed by Metal-Workers. With the Application of the Art of Electro-Metallurgy to Manufacturing Processes; collected from Original Sources, and from the Works of Holtzapffel, Bergeron, Leupold, Plumier, Napier, Scoffern, Clay, Fairbairn, and others. By OLIVER BYRNE. A new, revised, and improved edition, to which is added An Appendix, containing THE MANUFACTURE OF RUSSIAN SHEET-IRON. By JOHN PERCY, M.D., F.R.S. THE MANUFACTURE OF MALLEABLE IRON CASTINGS, and IMPROVEMENTS IN BESSEMER STEEL. By A. A. FESQUET, Chemist and Engineer. With over Six Hundred Engravings, Illustrating every Branch of the Subject $7 00

CONTENTS.—CHAPTER I. ON METALLURGIC CHEMISTRY. The Useful Metals and Metallic Ores Defined; History of Metallurgy; Refining Processes; New Refining Processes; Advantages of Cast-iron; Crystallizing tendency of Wrought-iron in large masses; Classification of Metals; Alloys; Affinity of Metals; Theory of Alloys; Metallic Oxides; Reduction of Metallic Oxides; Carburetted Hydrogen; Sulphides; Chlorides; Calcination and Roasting; Carburets and Carbons; Metallic Salts.

II. Special Metallurgic Operations. Volatile Combinations; Metallic Distillation Processes; Fluxes and Fluxing; Furnaces; The Combustive Function; Products of Combustion; Natural and Artificial Blasts; Blast Machines; Catalan Trompe; Chain Blast; The Cagniardelle.

III. Recently-Patented Refining Processes. Plant's Process; Martien's Process; Clay's Process; Bessemer's Process; Bessemer's Converting Vessel; Application of the tuyeres; Pouring out the Fluid Metal; Preparing the Vessel; Process of Conversion Explained; Bessemer's Squeezers; Bessemer's Hammer and Gauge; Analysis of Bessemer's Iron; Analysis of ordinary Puddle-iron; Reflections on Bessemer's Process.

IV. Refining and Working of Iron. Iron Furnaces in the United States; Dickerson's Method of making Wrought-iron directly from the Ore; Manufacture of Malleable iron; Puddling; Winslow's Machine for Compressing Puddlers' Balls; Rollers, or Rolls of the Iron Works; Angle or T Iron; Varieties of Iron.

V. Manufacture of Steel. Cementation; Blistered Steel; Shear Steel; Cast-steel; Characteristics and Qualities of Steel; Works on Iron and Steel.

VI. Forging Iron and Steel. Management of Fires; The Blast; Furnaces, Forges, and Hearths; Hand-forging; Anchors; Tongs and general Tools; Oliver or small Lift-hammer; Management of Fires—the Degrees of Heat; Ordinary Practice of Forging; Drawing Down, Jumping, Building Up, or Welding; Set-hammers, Flatters, Top-fullers; Twisting the Work; Practice of Hammering; Anvils; Methods in Forging: Making Bolts and Nuts; Mortises; Levers, Arms, Brackets, and Frames.

VII. On Wrought-iron in Large Masses. Forge Tools; Limits of Welding Power; Auxiliary Tools; Forge-hammers; Nasmyth's Steam-hammer; Effects of Nasmyth's Hammer; Materials for Forging; Tendency of Over-refined Iron to Deteriorate; Cast and Wrought-iron for Ordnance: Tensile Strength of the Monster-gun; Material used in Forging; Varieties of Treatment Required; Modes of Working large Forgings; Different Modes of Forging large Iron Masses; Forging the Monster-gun; Crystallization Explained; Crystalline Tendency of Iron; Causes of Fissures and their Remedy; Danger of Forgings in Cooling; Report of the Franklin Institute on the "Princeton's" Gun; Effects of Hammer Hardening; Importance of Metallurgy to Engineers.

VIII. General Examples of Welding. Shutting Together, Shutting Up; Welding heavy Works; The But Joint; To Form a T Joint; Conical Sockets, Wrought-iron Hinges; Musket-barrels; Damascus-twist, Stub-twist, and Wire-twist; Wrought-iron Tubes; Chains; Chain-cables; Tires of Wrought iron Wheels for Locomotives; Hatchets; Spades; Concluding Remarks on Forging, and the Applications of Heading Tools, Swage Tools, Punches, etc.; Heading Tools; Swage Tools; Trip and Tilt Hammers, Manufactured at the Lowell Machine-shop.

IX. Hardening and Tempering. General View of the Subject; Hammer Hardening; The Quantity of Carbon in Cast-iron; Steel and Glass Polarized; Practice of Hardening and Tempering Steel; Common Examples of Hardening and Tempering Steel; Razors, Pen-knives, Hatchets, Adzes, Cold Chisels; Saws and Springs; Less Common Examples of Hardening and Precautionary Measures; Jacob Perkins's Discovery; Oldham's Process.

X. Hardening Cast and Wrought-Iron. Chilled Iron Castings; Malleable Iron Castings; Case-hardening Wrought and Cast-iron.

XI. On the Application of Iron to Ship-building. Earliest use of Iron in Canal-boat and Ship-building; Variation of the Compass in Iron-vessels Rectified; Construction of Iron-vessels for Ocean Traffic; Half Cross Section of a Frigate; Ribs; Keels; Decks; Form of the Deck-beams; Riveting of the Plates; Single and Double Riveted Lap-joints; Wood and Iron as Materials for Ship-building; Resistance to Tension and Compression in Iron-ships; Practical Tests of Iron-ships; Durability; Economy; Effects of Shot on Iron-ships,

XII. The Metals and Alloys Most Commonly Used. Description of the Physical Character and Uses of the Metals and Alloys commonly employed in the Mechanical and Useful Arts: Antimony; Bismuth; Copper; Alloys of Copper and Zinc only; Remarks on the Alloys of Copper and Zinc; Alloys of Copper and Tin only; Remarks on the Alloys of Copper and Tin only; Alloys of Copper and Lead only; Remarks on the Alloys of Copper and Lead only; Alloys of Copper, Zinc, Tin, and Lead; Remarks on Alloys of Copper, Zinc, Tin, and Lead; Gold Alloys; Nickel; Palladium; Platinum; Rhodium; Silver; Silver Alloys; Tin; Zinc; Babbitt's Anti-attrition Metal; Fenton's Anti-friction Metal; Alloy of the Standard Measure Used by Government; Tutenage; Expansion Metal; Tables of the Cohesive Force of Solid Bodies; Tabular View of some of the Properties of Metals; Weights of Wrought-iron, Steel, Copper, and Brass Wire and Plates.

XIII. Remarks on the Character of the Metals and Alloys. Hardness,

Fracture, and Color of Alloys; Malleability and Ductility of Alloys; Strength or Cohesion of Alloys; Alloy-balance; Table for Converting Decimal Proportions into Divisions of the Pound Avoirdupois; Fusibility of Alloys; M. Mallett's Process for the Protection of Iron from Oxidation; Palladiumizing Process.

XIV. Melting and Mixing the Metals. The Various Furnaces, etc., for Melting the Metals; Antimony, Copper, Gold, and Silver, and their Alloys; Observations on the Management of the Furnace, and on Mixing Alloys; Britannia Metal; Barron's Furnace.

XV. Casting and Founding. Metallic Moulds; Earthen Moulds; Complex Moulds; Metal Moulds for Pewter Works; Bearings for Locomotive Engines; Type Founding; Plaster of Paris Moulds and Sand Moulds; Stereotype Founding; Moulding Sand and Flasks; Patterns, Moulds, and Moulded Simple Objects; Foundry Patterns; Cores of Moulds; Moulding Cored Works; Cored-boxes; False Core and Draw-back; Reversing and Figure-casting; Casting Figures, Ornaments, Branches, and Foliage; Filling the Moulds; Gun Metal and Pot Metal; Iron Founders' Flasks and Sand-moulds; Remarks on Patterns for Iron Castings; Loam Moulding; Melting and Pouring Iron; New Method of Manufacturing Drop Shot.

XVI. Works in Sheet Metal Made by Joining. On Malleability, etc.—Division of the Subject; Terrestrial Globes; Works in Sheet Metal made by Cutting, Bending, and Joining; A Hexagonal Box; Polygonal Figures of all Kinds; Prismatic Vessels; Pyramids; Frustums of Pyramids; Mixed Polygonal Figures; Radiating Pieces for Polygonal Vases; Polygonal Vases of Unequal Sides; Tools for Working in Sheet Metals; Modes of Bending Curved work; Improved Machine for Rolling Up Sheet-metal Pipe; Angle and Surface Joints; Francis's Metallic Life-boats.

XVII. Works in Sheet Metal, Made by Raising; and the Flattening of Thin Plates of Metal. Circular Works Spun in the Lathe; Works Raised by the Hammer; Solid and Hollow Blows; Raising and Hollowing; Raising Globes; Vases; Jelly Moulds; Stamping; Peculiarities in the Tools and Methods; Principle and Practice of Flattening Thin Plates of Metals with the Hammer.

XVIII. Processes Dependent on Ductility. Drawing Wires, etc.; Drawing Metal Tubes; Hydraulic Press and arrangement for Manufacturing Lead-pipe.

XIX. Soldering. General Remarks and Tabular View; Tabular View of the Process of Soldering; Hard Soldering; Soft Soldering; Soldering *per se*, or Burning Together; Alloys and their Melting Heats; Fluxes; Modes of Applying Heat; Modes of Applying Heat in Soldering; The Use of the Blowpipe; The Workshop Blowpipe; Examples of Hard Soldering; Examples of Soft Soldering; Richemont's Airo-hydrogen Blowpipe.

XX. Shears. Cutting Nippers for Wire; Scissors and Shears for Soft, Flexible Materials; Shears for Metal Worked by Manual Power; Engineers' Shearing Tools, generally worked by Steam-power.

XXI. Punches. Punches used without Guides; Punches used with simple Guides; Punches used in Fly-presses, and Miscellaneous Examples of their Products; Punching Machinery used by Engineers.

XXII. Drills. Drills for Metal, used by Hand; O'Tool's Pin-drill; Methods of Working Drills by Hand-power; Drill Stocks; Pump-drill; Press-drill; Expanding Braces and Lever-drill; Ratchet-drill; Differential Screw-drill; Drilling and Boring Machine; Broaches for Making Taper-holes.

XXIII. Screw-cutting Tools. Originating Screw; Cutting Internal Screw with Taps; The Principle of Chamfering; Transverse Sections of Taps; Die Stocks; Master-taps; Bolt-screwing Machine; Shaping Machine; Screws Cut by Hand in a Common Lathe; Cutting Screws in Lathes with Traversing Mandrels; Cutting Screws in Lathes with Traversing Tools; Healey's Screw-cutting Apparatus; System of Change-wheels for Screw-cutting; Screw-tools for Angular Threads; Screw-tools for Square Threads; Various Modes of Originating and Improving Screws; Fusee Engine; Ramsden's Screw-cutting Engine; Clement's mode of originating the Screw-guide; Chucking and Reaming Lathe; Engine-lathe; Screw-threads considered in respect to their Proportions, Forces, and General Characters; The Measures and Relative Strengths of Screws; Sections Derived from the Angular Thread; Sections Derived from Square Threads; Table for Angular Thread-screws; Table for Small Screws of Fine Angular Threads; Approximate Values of Holtzapffel's Original Screw-threads; Holtzapffel's Original Taps.

XXIV. History of the Art of Electro-Metallurgy. Volta's Discovery; Chemical Decomposition by the Pile; First Battery; Decomposition by the Battery, and its Application; Deposition of Metals upon Others; Gilding; Early Opinions concerning Electro-decomposition; How these results Affect the Discovery; Use of Observed Facts; Spencer's First Experiments; Jacobi's Experiments; Jordan's Experiments; Spencer's First Printed Paper upon Electrotype; Historical Anomaly; Plumbago as

a Coating; Separate Battery; Laws of Deposition; Works Published on Electro-Metallurgy; Patents taken ont for Electro-Metallurgy.

XXV. DESCRIPTION OF GALVANIC BATTERIES AND THEIR RESPECTIVE PECULIARITIES. Nomenclature; Proposed Terms; Batteries; Single Pair of Plates; Best Kind of Zinc; Amalgamation of the Zinc Plates; Economy in Amalgamation; Distance Between the Battery Plates; Different Elements of Batteries; Properties of Metals fit for Batteries; Babington's Battery; Wollaston's Battery; Modification of Wollaston's Battery now in Use; Defects of common Acid Batteries; Daniell's Battery; Grove's Battery; Bunsen's Battery; Smee's Battery; Earth Battery; Magneto-Electric Machine.

XXVI. ELECTROTYPE PROCESSES. Single-cell Operations; Preparation of the Coin; Forms of Apparatus; Comparative View of Exciting Solutions; How often Solutions should be Changed, and Zinc Amalgamated; Making of Moulds; Preparation of Wax; To take Moulds in Wax; Rosin with Wax; Moulds in Plaster; Moulds in Fusible Alloy; Moulds in Gutta-percha; Moulds from Ferns, Seaweeds, etc.; Nature Printing; Casting of Reptiles, etc.; Wax Moulds from Plaster; Mould of Plaster from Plaster Models; Fusible Alloy from Plaster; Copper Moulds from Plaster; Elastic Moulding; Moulding of Figures; Figures Covered with Copper; The Preparation of Non-metallic Moulds to Receive Deposit; Using Metal Moulds; Precautions on putting Moulds into a Solution; Deposit on large Objects; To make Busts and Figures; Coating of Flowers, etc.; Fignres from Elastic Moulds; Electrotypes from Daguerreotypes; Depositing by Separate Battery; Size of the Electrodes; Relative Power of Batteries; Constancy of Batteries; Comparative Power of Batteries; Recovery of Mercury from waste Zinc; Componnd Cell Process; Effects of Resistance; Intensity; Relative Intensity of Batteries; Mode of Suspending Objects in Coating; Non-transfer of Elements; Effects of Difference in the Density of Solutions; Crystals of Copper on Electrodes.

XXVII. MISCELLANEOUS APPLICATIONS OF THE PROCESS OF COATING WITH COPPER. Coppered Cloth; Calico-printers' Rollers; Etching of Rollers; Printing; Glyphography; Instruction on Glyphography for the Amateur; Copying of Copper-plate Engravings; Coating of Glass and Porcelain; On Galvanic Soldering; Graham Plastic Niello.

XXVIII. BRONZING. Brown Bronzes; Another Method; Black Bronzes; Green Bronzes.

XXIX. DEPOSITIONS OF METALS UPON ONE ANOTHER. Coating of Iron with Copper; Cyanide of Potassium; Cyanide of Copper; Peculiarities in working Cyanide of Copper Solution; Preparation of Iron for Coating with Copper; Effects of Conducting Power in Solutions and Metals; Illustration of Conduction; Non-adherence of Deposit; Coating Cast-iron with Other Metals; Coating of Iron with Zinc; Sulphate of Zinc; Use of Zinc Coating; Influence of Galvanism in Protecting Metals from Destruction by Oxidation and Solution.

XXX. ELECTRO-PLATING. To Make Silver Solution; Cyanide of Silver dissolved in Yellow Prussiate of Potash; Solution made with Oxide of Silver; Solution made with Chloride of Silver; The best Method of Making Silver Solutions; Hyposulphite of Silver Solution; Sulphite of Silver-plating Solution; To Recover Silver from Solution; Preparation of Articles for Plating; Practical Instructions in Plating; Taking Silver from Copper, etc.; Cyanide of Silver and Potassium—Decomposition during the Plating Process; Other Effects produced in Working; Machine for Moving Goods while subjected to the Electro-plating Process; Opposite Currents of Electricity from Vats; Tests for the Quantity of Free Cyanide of Potassium in Solutions; Rate of Depositing Silver; Bright Deposit; Different Metals for Plating; Electricity given off from Sandy Deposits; The Old Method of Plating; Advantages of Electro-plating; Objections to Electro-plating; Solid Silver Articles made by the Battery; Dead Silvering for Medals; Oxidizing Silver; Protection of Silver Surface; Cleaning of Silver.

XXXI. ELECTRO-GILDING. Preparation of Solution of Gold; Battery Process of Preparing Gold Solution; Process of Gilding; Conditions required in Gilding; Maintaining the Gold Solution; To Regulate the Color of the Gilding; Coloring of Gilding; To Dissolve Gold from Gilt Articles; To Recover the Gold; Objections to Electro-gilding; Effects of Cyanogen on Health; Practical Suggestions in Gilding; Deposition of Bronze.

XXXII. RESULTS OF EXPERIMENTS ON THE DEPOSITION OF OTHER METALS AS COATINGS. Coating with Platinum; Coating with Palladium; Coating with Nickel; Antimony, Arsenic, Tin, Iron, Lead, Bismuth, and Cadmium; Iron; Lead; Aluminium and Silicium; Tin; Antimony; Deposition of Alloys.

XXXIII. THEORETICAL OBSERVATIONS.

APPENDIX.—The Manufacture of Russian Sheet Iron. The Manufacture of Malleable Iron Castings. Improvements in Bessemer Steel.

INDEX.

Caldwell.—Lightning Slide Valve Calculator.

By JOHN A. CALDWELL. Card with descriptive pamphlet . . $3 00

The Calculator is made of stiff card-board 11 × 14, and is varnished ready for use in the shop. A paper template is made to revolve and develop the motion of the valve. Any travel of valve or stroke of engine can be developed in a few moments. All calculations relating to the action of the Slide Valve, no matter how intricate, can be solved in a few moments by the use of the Calculator. The information it gives is read off at sight, and is at once intelligible and CORRECT. By a short examination the following points can be ascertained by a person of common attainments, every point proving itself as the examination progresses: 1. The proper travel of Valve to produce certain results. 2. The proper Lap to Cut off at given part of stroke. 3. The proper Lap to Exhaust at given part of stroke. 4. The proper Lap to Cushion at given part of stroke. 5. The proper Lap to Cut off equal on each side of Piston. 6. The proper Lap to Exhaust equal on each side of Piston. 7. The proper Lap to Cushion equal on each side of Piston. 8. The proper width of Exhaust Port to prevent back pressure. 9. The proper Lead to give the valve. 10. The proper amount of opening for admission of Steam. 11. The position of Eccentric on Shaft. 12. The relation of Valve to Piston at every part of Stroke. These points ascertained at sight with Lead or without it.

Campin.—A Practical Treatise on Mechanical Engineering:

Comprising Metallurgy, Moulding, Casting, Forging, Tools, Workshop Machinery, Mechanical Manipulation, Manufacture of Steam-engines, etc. etc. With an Appendix on the Analysis of Iron and Iron Ores. By FRANCIS CAMPIN, C. E. To which are added, Observations on the Construction of Steam Boilers, and Remarks upon Furnaces used for Smoke Prevention; with a Chapter on Explosions. By R. Armstrong, C. E., and John Bourne. Rules for Calculating the Change Wheels for Screws on a Turning Lathe, and for a Wheel-cutting Machine. By J. LA NICCA. Management of Steel, including Forging, Hardening, Tempering, Annealing, Shrinking, and Expansion. And the Case-hardening of Iron. By G. EDE. 8vo. Illustrated with 29 plates and 100 wood engravings. $6 00

ABSTRACT OF CONTENTS.—Introduction—On Metallurgy; on Forging Iron; on Moulding and Casting; on Cutting Tools; on Workshop Machinery; on Manipulation; on the Physical Basis of the Steam-engine; On the Principles of Mechanical Construction; on the General Arrangement of the Steam-engine; on the General Principles of Steam Boilers; Preliminary Considerations on the Applicability of various kinds of Steam-engines to various purposes; on the details of Steam-engines; on Pumps and Valves; on Steam Boilers; on Propellers; on various applications of Steam-power and Apparatus connected therewith; on Pumping Engines; on Rotative Engines; on Marine Engines; on Locomotive Engines; on Road Locomotives; on Steam Fire Engines; on Boilers generally, and a Radical Reform in those for Marine purposes suggested; Smoke prevention and its fallacies; Remarks on Smoke-burning, by John Bourne; Explosions: an investigation into some of the causes producing them, and into the deterioration of Boilers generally; Rules for Calculating the Change Wheels for Screws on a Turning Lathe, and for a Wheel-cutting Machine; Explanation of the Methods of Calculating Screw Threads; the Management of Steel.

APPENDIX.—The Analysis of Iron and Iron Ores.

GLOSSARY.—INDEX.

Campin.—The Practice of Hand-Turning in Wood, Ivory, Shell, etc.:

With Instructions for Turning such works in Metal as may be required in the Practice of Turning Wood, Ivory, etc. Also, an Appendix on Ornamental Turning. By FRANCIS CAMPIN: with Numerous Illustrations, 12mo, cloth $3 00

Callingham.—Sign Writing and Glass Embossing;

A Complete Practical Illustrated Manual of the Art. By JAMES CALLINGHAM. In one volume 12mo. $1 50

CONTENTS.—CHAPTER I. INTRODUCTORY. II. DRAWING ESSENTIAL LINES—Straight Lines and Curves—Method of Practice—Freedom of Hand—Circles—Parallel Lines—Uniformity of Outline—Adjustment of the Letters. III. SETTING OUT THE WRITING—Classes of Alphabets—Individuality of Style—"Snapping" a Chalk Line—Adjusting the Lines—Arc of Circle and Scroll—Sketching out the Writing—Balancing—Number of Lines—Slanting Letters. IV. COMMON ALPHABETS AND NUMERALS—Attainment of Legibility and Distinctness in our Alphabets—Improvements—Arabic Numerals and their Modifications—Roman Letters the Groundwork of Modern Alphabets—Varieties of Styles—Introduction of San-seriff—Egyptian—Clarendon—Type Cutters and Writers—Proportions of Alphabetic Characters—Seriffs—Position of Cross-Bars—Capitals and Small Letters—Thick and Thin Strokes—The Letter S—Method of Forming it—San-seriff S—Extremities of S and C—C and G—Sign Writing on the Continent—Albert Durer—Thickness of the Letters—Moxon—Dutch Letters—Curves and Points—San-seriff N and M—The Short-and, &—The Roman J and G—R—Q—Italics—Old-face Type—Modern—Mediæval Alphabets—The late Prince Consort's Taste—Keeping—Consistency. V. ANCIENT AND ORNAMENTAL ALPHABETS—Originality—Use of Ornaments—Harmony—Want of Harmony—Sir M. Digby Wyatt—Illuminated Work—Writing Scripture Texts in Churches—Ancient Church Inscriptions—Incongruities—"The Model Outline"—Characteristics of Mediæval Alphabets—Obsolete Forms—Alphabets of the Twelfth Century—I and J—U, V, and W—The Fifteenth Century—Capitals and Minuscules—Different Forms of Roman Letters—Letters of the Tudoresque Period—Careless but Graceful Outlines—Set Styles—Legible and Illegible Writing—Symmetry and Grace. VI. THICKNESSES AND SHADOWS—Blocked or Raised Letters—Linear Perspective—The Thickness—The Shadow—Geometrical Solids—Deceiving the Eye—Object of Thicknesses—Imitation—Light and Shade—Gradations of Tints—Reflections—Representation of Solid Bodies—Laws of Optics—Examples—Sunk Letters. VII. LETTERS IN PERSPECTIVE—Geometrical Problem for Expanding or Contracting Letters—Elements of Perspective—Perspective of Raised Letters—Perspective of Shadows—Examples—Effect of Distance—To Test the Work—Perspective Italic. VIII. COLORS USED IN SIGN WRITING. IX. HINTS ON COLORING. X. GOLD LEAF AND GILDING. XI. GLASS EMBOSSING. XII. BURNISHED GILDING ON GLASS. XIII. ORTHOGRAPHICAL AND OTHER ERRORS.

Carey.—The Works of Henry C. Carey:

FINANCIAL CRISES, their Causes and Effects. 8vo. paper . 25

HARMONY OF INTERESTS: Agricultural, Manufacturing, and Commercial. 8vo., cloth $1 50

MANUAL OF SOCIAL SCIENCE. Condensed from Carey's "Principles of Social Science." By KATE MCKEAN. 1 vol. 12mo. . $2 25

MISCELLANEOUS WORKS: comprising "Harmony of Interests," "Money," "Letters to the President," "Financial Crises," "The Way to Outdo England without Fighting Her," "Resources of the Union," "The Public Debt," "Contraction or Expansion?" "Review of the Decade 1857–'67," "Reconstruction," etc. etc. 8vo., cloth . $10 00

PAST, PRESENT, AND FUTURE. 8vo. $2 50

CONTENTS.—CHAPTER. I.—Man and Land. II.—Man and Food. III.—Wealth. IV.—Wealth and Land. V.—Man and his Standard of Value. VI.—Man and his Fellow-Man. VII.—Man. VIII.—Man and his Help-Mate. IX.—Man and his Family. X.—Concentration and Centralization. XI.—Colonization. XII.—Ireland. XIII.—India. XIV.—Annexation. XV.—Civilization—The Future.

PRINCIPLES OF SOCIAL SCIENCE. 3 volumes, 8vo., cloth $10 00

CONTENTS.—Volume I. Of Science and its Methods—Of Man, the Subject of Social Science—Of increase of the Numbers of Mankind—Of the Occupation of the Earth—Of Value—Of Wealth—Of the Formation of Society—Of Appropriation—Of Changes of Matter in Place—Of Mechanical and Chemical Changes in the forms of Matter. Volume II. Of Vital Changes in the Form of Matter—Of the Instrument of Association—(Money). Volume III. Of Production and Consumption—Of Accumulation—Of Circulation—Of Distribution—Of Concentration and Centralization—Of Competition—Of Population—Of Food and Population—Of Colonization—Of the Malthusian Theory—Of Commerce—Of the Societary Organization—Of Social Science.

RECONSTRUCTION: INDUSTRIAL, FINANCIAL, AND POLITICAL. Letters to the Hon. Henry Wilson, U. S. S. 8vo., paper 50

THE RESOURCES OF THE UNION. A Lecture read, Dec. 1865, before the American Geographical and Statistical Society, N. Y., and before the American Association for the Advancement of Social Science, Boston 50

THE SLAVE-TRADE, DOMESTIC AND FOREIGN; Why it Exists, and How it may be Extinguished (1853). 8vo., cloth . . $2 00

CONTENTS.—The Wide Extent of Slavery—Of Slavery in the British Colonies—Of Slavery in the United States—Of Emancipation in the British Colonies—How Man passes from Poverty and Slavery towards Wealth and Freedom—How Wealth tends to Increase—How Labor acquires Value and Man becomes Free—How Man passes from Wealth and Freedom toward Poverty and Slavery—How Slavery grew, and How it is now maintained in the West Indies—How Slavery grew, and is maintained in the United States—How Slavery grows in Portugal and Turkey—How Slavery grows in India—How Slavery grows in Ireland and Scotland—How Slavery grows in England—How can Slavery be Extinguished?—How Freedom grows in Northern Germany—How Freedom grows in Russia—How Freedom grows in Denmark—How Freedom grows in Spain and Belgium—Of the Duty of the People of the United States—Of the Duty of the People of England.

REVIEW OF THE REPORT OF HON. D. A. WELLS, Special Commissioner of the Revenue (1869). 8vo. paper . . . 50

LETTERS ON INTERNATIONAL COPYRIGHT (1867) . 50

REVIEW OF THE FARMER'S QUESTION (1870) . . 25

THE UNITY OF LAW: As Exhibited in the Relations of Physical, Social, Mental, and Moral Science (1872). In one vol. 8vo., pp. xxiii., 433. Cloth $3 50

This may be regarded as MR. CAREY'S final treatise, completing the system of Social Science, in developing and demonstrating the truths of which he has been engaged for nearly forty years, and showing its relations to the other sciences; it is in fact the fully matured result of labors which have caused a revolution in the modes of thought in regard to many important economic questions throughout the world. It is believed that this volume will attract the attention of a more widely extended body of readers and thinkers than any previous work of a similar character written in this country. No real lover of science in its broadest and most catholic sense can disregard or overlook it.

CONTENTS.—CHAPTER I.—A Science Based Upon Assumptions. II.—Of Science and its Methods. III.—Of Man, the Subject of Social Science. IV.—Of the Physical and Social Laws. V.—Of the Societary Organization. VI.—Of Matter and Mind. VII.—Of Matter and Mind—Continued. VIII.—Of Matter and Mind—Continued. IX.—Of Matter and Mind—Continued. X.—Of Mind and Morals. XI.—Of Mind and Morals—Continued. XII.—Of Civilization. XIII.—Of Scientific Relations. XIV.—Definitions. APPENDIX.—A.—The Law of Distribution. B.—Occupation of the Earth. C.—Statistical Facts. D.—The Opium Trade. E.—Effects of an Exclusive Agriculture. F.—The Proletariat. Index.

WEALTH, OF WHAT DOES IT CONSIST? (1870.) . . 25

Cabinet Maker's Album of Furniture:

Comprising a Collection of Designs for the Newest and Most Elegant Styles of Furniture. Illustrated by Forty-eight Large and Beautifully Engraved Plates. In one volume, oblong $5 00

The Plates of this beautiful volume Comprise Designs for Bedsteads in Great Variety; Chests of Drawers; Wardrobes; Dressing Bureaus; Tables for the Chamber; Work-Tables; Extension Dining-Tables; Card and Chess Tables; Parlor Tables, Louis XV., and other styles; Office Tables; Chiffoniers; Ladies' and other Secretaries of different forms and styles; Toilet Tables and Glasses; Desks; Book-cases; Side-boards; &c. &c. &c.

Colburn.—The Locomotive Engine:

Including a Description of its Structure, Rules for Estimating its Capabilities, and Practical Observations on its Construction and Management. By ZERAH COLBURN. Illustrated. A new edition. 12mo. . $1 25

Craik.—The Practical American Millwright and Miller.

By DAVID CRAIK, Millwright. Illustrated by numerous wood engravings, and two folding plates. 8vo. $5 00

CONTENTS.—PART I. INTRODUCTION—CHAPTER I. Mechanical Powers, The Lever, The Inclined Plane, The Wedge, The Screw, The Pulley and Cord, The Crank. II. Fly and Balance Wheels, Centrifugal Force and Circular Motion, Action and Reaction, Friction. III. Transmission and Transportation of Motive Power. IV. Peculiarities and Properties of Pressure of Water, Taking Levels, Fitting down Sills under Water, Pressure of Water, Velocity of Falling Water, Tables of Velocity of Water and Quantity Discharged, Measuring a Stream of Water, Table of the Quantity of Water passing over a Wier. PART II.—WATER WHEELS. V. The Undershot. VI. The Overshot. VII. Experiments with Wheels, Barker's Wheel. VIII. Central Discharge Wheels. IX. Spiral Discharge Wheels, The Rose Wheel. X. Spiral or Screw Flood Wheels. XI. Mill-Dams. PART III.—SAW-MILLS. XII. The English Gate. XIII. The Mulley Saw. XIV. The GANG. XV. The Circular Saw-Mill, The Edging Circular, Table of Logs reduced to Inch-board Measure. PART IV.—GRIST-MILLS. XVI. Planning, Gearing, Belt Gearing, Gearing Overshots, The Building, The Husk Timbers, etc., The Bridge Trees, The Step, The Spindle, The Bed-Stone, The Driver, The Damsil, The Boxes, The Boshes, The Curb, The Hopper, Shoes, Mill-stones, Burr Stones, Trueing the Stones, Draught, Dressing the Stones, The Quarter Dress, The Sickle Dress, Balancing the Runner, Bolts, Bolt Chests, Bolt-Cloth, Smut Machines, Screens, Merchant or Manufacturing Bolts. PART V.—XVII. The Oatmeal Mill, The Kiln, The Process of Drying, Dressing, and Hanging the Stones, Manufacture of Split Peas. XVIII. The Barley Mill. XIX. Wool Carding and Cloth Fulling and Dressing, The Tenter Bars, The Shearing Machine, The Cloth Press. XX. Windmills. XXI. Steam Power. INDEX.

Cupper.—The Universal Stair-Builder:

Being a new treatise on the Construction of Stair-cases and Hand-rails; showing Plans of the various forms of Stairs, method of Placing the Risers in the Cylinders, general method of describing the Face Moulds for a Hand-rail, and an expeditious method of Squaring the Rail. Useful also to Stonemasons constructing Stone Stairs and Hand-rails; with a new method of Sawing the Twist Part of any Hand-rail square from the face of the plank, and to a parallel width. Also, a new method of forming the Easings of the Rail by a gauge; preceded by some necessary Problems in Practical Geometry, with the Sections of Prismatic Solids. Illustrated by 29 plates. By R. A. CUPPER, Architect, author of "The Practical Stair-builder's Guide." Third edition. One large 4to. volume $7 50

Cooley.—A Complete Practical Treatise on Perfumery:

Being a Hand-Book of Perfumes, Cosmetics, and other Toilet Articles, including Instructions and Cautions respecting their Selection and Use. With a Comprehensive Collection of Formulæ and Directions for their Preparation. By ARNOLD J. COOLEY, author of the "Hand-Book of the Toilet," "Hand-Book of Compound Medicines," etc. 12mo. cloth, $1 50.

*** This is one of the most complete works on Perfumery which has ever been published in the English language, and it contains an extensive variety of receipts in every branch of the art.

CONTENTS.—COSMETICS; Their Classification, Preparation, etc. Formulæ, Directions, Cautions. I. Skin Cosmetics. II. Hair Cosmetics. III. Cosmetics for the Teeth, Tooth Cosmetics; PERFUMES, PERFUMERY, FORMULA, DIRECTIONS, etc. Certain Substances employed in Cosmetics, Perfumes, etc. Supplemental Notices and Formulæ previously referred to. Miscellaneous Formulæ. Conclusion. APPENDIX.

Duncan.—Practical Surveyor's Guide:

Containing the necessary information to make any person, of common capacity, a finished land surveyor without the aid of a teacher. By ANDREW DUNCAN. Illustrated. 12mo., cloth $1 25

Duplais.—A Treatise on the Manufacture and Distillation of Alcoholic Liquors:

Comprising Accurate and Complete Details in Regard to Alcohol from Wine, Molasses, Beets, Grain, Rice, Potatoes, Sorghum, Asphodel, Fruits, etc.; with the Distillation and Rectification of Brandy, Whiskey, Rum, Gin, Swiss Absinthe, etc., the Preparation of Aromatic Waters, Volatile Oils or Essences, Sugars, Syrups, Aromatic Tinctures, Liqueurs, Cordial Wines, Effervescing Wines, etc., the Aging of Brandy and the Improvement of Spirits, with Copious Directions and Tables for Testing and Reducing Spirituous Liquors, etc. etc. Translated and Edited from the French of MM. DUPLAIS, Ainé et Jeune. By M. MCKENNIE, M.D. To which are added the United States Internal Revenue Regulations for the Assessment and Collection of Taxes on Distilled Spirits. Illustrated by fourteen folding plates and several wood engravings. 743 pp. 8vo. $10 00

CONTENTS.—PART I. CHAP. I. ALCOHOL. II. FERMENTATION: Saccharine or Glucosic Fermentation; Vinous or Alcoholic Fermentation; Sugar, Water, Heat, The Air, Ferment; Phenomena of the Vinous Fermentation; Accidents of Fermentation: Acid Fermentation, Putrid and Viscous Fermentation, Lactic Fermentation, Frothing; Sweat-house and Fermenting Vats. III. DISTILLATION: Distilling Apparatus; The Simple Apparatus; Continued Apparatus; Derosne's Apparatus; Egrot's New Apparatus for

Continuous Distillation; Belgian Apparatus; Apparatus for Distilling Pasty or Semi-fluid Materials; Rectifying Apparatus; Apparatus for Distilling Rum; Machines and Utensils necessary for a Distillery. IV. On the Application of Heat to Distillation: Heating by the Naked Fire; Heating by Steam. V. Some Considerations upon Distillation as Applied to Alcohol. VI. Distillation of Alcohol: Spirits of Wine (Alcohol from Wine); Wine: Vintage, Crushing, Vatting, Chemical Composition of Must, Fermentation, Improvement of Must, Drawing Off (Racking), Expressing, Chemical Composition of Wine; Choice of Wines for Distillation; Distillation; Trois-Six or Spirits of Wine (Rectified Spirits); Alcohol from Molasses: Variety and Selection of Molasses, Fermentation; Alcohol from Beets; Chemical Analysis of the Beet; Different Processes for Distilling Beets; Distillation of Beet Spirit by Rasping and Pressure; Distillation of the Beet by Maceration: Maceration by Water, Maceration by Heat, New Method of Maceration by Heat, Maceration—The Cold Process, Maceration of Beet Chips, Maceration by Spent Liquor; Direct Distillation of Beets: Process of Leplay; Rectified Beet Spirit; Grain Spirit: Choice of Grain, Chemical Composition of Grain, Dextrine, Diastase, The Alcoholic Product of Grain; Preparatory Operations which are Necessary before submitting Grain to the Alcoholic Fermentation: Steeping, Germination, Drying the Malt, Grinding, Mashing, Infusion; Alcoholic Fermentation of Grain: Method of Dombasle, Another French Method, Old English Method, English Process, Belgian Process, New Process generally Used in Belgium, Chemical Process; Alcohol from Rice; Alcohol from Potatoes: Selection of Potatoes, Testing the Quality of Potatoes; Processes for Distilling Potatoes: Distillation of Cooked Potatoes, Cooking, Reducing the Pulp, Mashing or Saccharifying by Malted Barley, Fermentation, Distillation; Distillation of Potatoes by Rasping and Maceration; Employment of the Residuum from the Distillation of Potatoes; Distillation of Potatoes by Saccharifying the Starch: Saccharification by Sulphuric Acid, Saccharification by Malt, The Fermentation, Distillation; Remarks on Spirits from Grain and Potatoes; Alcohol from Sorghum or Chinese Sugar-Cane; Apparatus of M. B. Viale; Alcohol from the Aspodel; Alcohol from Figs; Alcohol from Various Substances (Vegetable and Others); Alcoholizable Substances of the First Class; Alcoholizable Substances of the Second Class; General Observations on the Different Kinds of Alcohol. VII. Rectification: Essential Oils, Acids, Action of Heat; Management and Progress of Rectification; Purification of Backings—Phlegm (Spirits of bad taste, from Beets, Potatoes, Grain, &c.), by M. Ortlin. VIII. Distillation of Brandies: Brandies from Wine; Marc Brandy—Brandy from the Grape Pomace (Marc de Raisin); Distilling Apparatus of M. Villard, of Lyons; Cider Brandy, Apple Brandy; Portable Apparatus for Continuous Distilling; Pear Brandy; Brandy from Beer, Rum, Kirschenwasser or Kirctsh (Cherry Brandy), Gin, Geneva. IX. The Manufacture of Swiss Absinthe: Absinthe of Portarlier; Absinthe of Montpellier; Absinthe of Lyons; Absinthe of Fougeolles; Absinthe of Besançon; Absinthe of Nimes; White Absinthe; Apparatus for Manufacturing Absinthe and Perfumed Spirits: Management of the Apparatus; Causes of the Pernicious Effects of Absinthe. X. Alcoholometry: Thermometers; Table for converting degrees of the Centigrade Thermometer to degrees of that of Reaumur, and vicé versa; Table for converting degrees of the Fahrenheit Thermometer to degrees Centigrade; Table for converting degrees of Centigrade Thermometer to degrees Fahrenheit; Hydrometer, Alcoholmeter, Areometer; Centesimal Alcoholmeter of Gay-Lussac; Explanation of the Use of the Table indicating the actual strength of Spirituous Liquors at any given Temperature; Table indicating the actual strength of Spirituous Liquors; Comparison of the degrees of Baumé's Hydrometer with the real Specific Gravity; Table of the Proportion by Weight of Absolute or Real Alcohol in 100 parts of Spirits of different Specific Gravities; Alcoholmetric Scale of M. Stropé; Experimental Stills, Assay Still of Gay-Lussac; Assay Still of M. J. Salleron. XI. Reduction of Spirituous Liquors: Improving, Increasing the Strength, or Raising the Proof; Reduction; Table for Reducing Spirituous Liquors; Raising the Proof of Brandy; Table exhibiting the actual value of Spirits at 85 degrees centesimal (33° Cartier) reduced to all degrees of Proof found in the market; Receipts for Aging Brandies and other Spirits, for Improving them, and for Imitating the Aroma and Flavor of different Growths; Cutting or Mixing Common Brandies (Coupage); Imitation of Brandies; Process for Imitating the Brandy of Armagnac; Method of Imitating the Brandy of Saintonge; Method of Imitating Cognac Brandy; Improving Brandies; Low Wines prepared for reducing Spirits; Extract or Essence of Cognac; Improvement of Different Spirits; New Method of Distilling Wines, Practised in the Charentes.

Part II. Distillation of Perfumed Waters, Liqueurs, Essences, etc.: History of Liqueurs. Chap. XII. Distillation: The Laboratory, Storerooms, Cellars, etc.; Vessels and Utensils; Furnace: The Fireplace, The Grate, The Ashpit, The Chimney. XIII. Fuel: Coal, Coke, Charcoal, Turf; Application of Heat. XIV. Distillation

AND RECTIFICATION: Distillation as applied to Liqueurs; Rectification; The Selection and Preservation of Aromatic and other Substances: Flowers, Fruits, Plants, Seeds, Roots, and other Drugs. XV. WATER: As a Liquid, As a Gas, As a Solid; Filtration and Preservation of Water; Distilled Water. XVI. AROMATIC WATERS: Aromatic Distilled Waters; The Preservation of Aromatic Distilled Waters; Method of Depriving Aromatic Waters of their Odor; Receipts for Aromatic Distilled Waters: Water of Orange Flowers, Methods of Ascertaining the Quality of Orange Flower-water; Rose Water, Water of Violets, Water of Absinthe, Water of Hyssop, Peppermint Water, Water of Tea, Anise Water, Coriander Water, Water of Mocha Coffee, Cinnamon Water, Anglica Water, Water of Bitter Almonds, Lemon Water, Raspberry Water, Maraschino Water, Water of Green Walnuts; Aromatic Waters without Distillation. XVII. VOLATILE OILS OR ESSENCES: Volatile Oils or Essences by Distillation; Volatile Oils or Essences by Expression; Rectification of Volatile Oils or Essences; Sophistication of Volatile Oils and the Means of Detecting the Fraud: Sophistication by Fat or Fixed Oils, Sophistication by Alcohol, Sophistication by Common Volatile Oils; Receipts for the Volatile Oils or Essences: Volatile Oil or Essence of Roses, Volatile Oil or Essence of Cinnamon, Volatile Oil or Essence of Bitter Almonds; Table of Volatile Oils or Essences susceptible of being employed by the Distilling Liquorist; Volatile Oils by Maceration or Extraction. XVIII. SUGAR: Glucose, Grape Sugar, Sugar from Potato Starch, Syrup from Potato Starch, White Syrups, Colored Syrups, Syrup of Grain Starch, Syrup of Wheat, Honey, Levulose or Liquid Sugar, Levulose Mannite, Glycerrhizine or Saccharine Matter of Liquorice. XIX. CLARIFICATION OF SUGAR: Decolorizing Sugar; Saccharometer; Table Indicating the Quantity of Refined Sugar contained in a Litre of Cold Syrup. XX. SYRUPS: Degeneration and Preservation of Syrups; Receipts for Syrups: Simple Syrup, Syrup of Orange Flower, Syrup of Capillaire, Syrup of Tea, Syrup of Gum Arabic, Syrup of Marshmallow, Lemon Syrup, Syrup of Oranges, Syrup of Bitter Orange-peel, Syrup of Violets, Syrup of Orgeat, Currant Syrup, Syrups of Blackberries and Currants, Syrup of Cherries, Syrup of Raspberries, Syrup of Mulberries, Syrup of Brandy Punch, Syrup of Cherry Punch, Common Syrup of Rum Punch, Fine Syrup of Rum Punch, Glucosed Syrups, Syrup of Currants, Glucosed Syrup of Currants, Glucosed Syrup of Orgeat, Nos. 1 and 2. XXI. COLORING: A Fine Red Coloring; Common Red Coloring; Yellow Coloring; Caramel; Yellow Colorings, 1 and 2; Blue Colorings, 1, 2, and 3; Colorings for Curaçoa (demifin and surfin); Hematoxylin; Green Coloring; Violet Coloring. XXII. PERFUMED SYRUPS: Essences; Rectification of Perfumed Spirits; Backing or Flegm; Receipts for Perfumed Spirits: Essences of Orange Flowers, Roses, Violets, Absinthe (officinal), Absinthe (Roman), Genipi, Hyssop, Lavender, Balm, Peppermint, Angelica Seed, Dill, Aniseed, Star Anise, Caraway, Coriander, Comin Seed, Candy Carrot, Fennel, Raspberries, Angelica Root, Calamus, Ginger, Cascarilla, Rose-wood, Sandal-wood, Aloes, Catechu, Benzoin, Myrrh, Tolu, Muskmallow, Grains of Paradise, Cardamom, Ceylon Cinnamon, Cassia, Cloves, Mace, Nutmegs, Sassafras, Bitter Almonds, Apricot Seeds, Celery, Cedrat d'Anisette de Bordeaux, Curaçoa Ordinaire, Curaçoa de Hollande, Lemon, Orange, Concentrated Essence of Lemon and of Orange, Esprit d'Anisette Ordinaire, Essences of Coffee and Tea. XXIII. AROMATIC TINCTURES: Tinctures of Ambergris, Benzoin, Catechu, Musk, Storax, Tolu, Orrisroot, Vanilla, Curaçoa, The Hulls of Bitter Almonds, Smaller Absinthe, Hyssop, Galangal, Balm, Bay, Black Currant Leaves, Black Currants; Cassis, ordinaire and demifin; Tinctures of Raspberries, Black Cherries, Walnut Hulls, Raspberry Vinegar, Whortleberries, Elderberries. XXIV. LIQUEURS: Compounding; Perfume Mixing; Mellowing (Tranchage); Apparatus for Mellowing Liqueurs; Coloring, Sizing (Clarifying), Filtering, Storing, and Preservation of Liqueurs; Classification of Liqueurs; Nomenclature and Receipts for Liqueurs by Distillation: Anisette or Eau d'Anis, Eau d'Angelique, Cent Sept Ans, Curaçoa, Fleurs d'Oranger, Framboises, Mint, Eau de Noyaux, Parfait Amour, Huile de Roses, Eau des Sept Graines, Vespétro; Liqueurs Double: Anisette or Eau d'Anis, Eau d'Angélique, Cent Sept Ans, Curaçoa, Fleurs d'Oranger, Framboises, Huile de Menthe, Eau de Noyaux, Parfait Amour, Huile de Roses, Eau des Sept Graines, Vespétro; Liqueurs Demi-fines: Anisette, Crème d'Angélique, Crème de Celeri, Cent Sept Ans, Curaçoa, Crème de Fleurs d'Oranger, Huile de Framboises, Crème de Menthe, Crème de Moka, Crème de Noyaux, Parfait Amour, Huile de Roses, Eau des Sept Graines, Vespétro, Punch Liqueur; Fine Liqueurs (Liqueurs Fines): Anisette, Crème d'Angélique, Cent Sept Ans, Curaçoa, Eau de Vie d'Andage, Eau de Vie de Dantzick, Crème de Fleurs d'Oranger, Crème de Framboises, Huile de Kirschenwasser, Crème de Menthe, Crème de Noyaux, Crème de Moka, Huile d'Oeillets, Parfait Amour, Huile de Rhum, Huile de Roses, Eau des Sept Grains, Scubac, Crème de Thé, Vespétro, Punch Liqueur; Superfine Liqueurs (Liqueurs Surfines): Liqueurs Surfines Françaises, Anisette de Bordeaux, Anisette de Paris, Anisette de Lyon, Délices de Rachel, Crème d'Absinthe, Crème d'Angélique, Elixir de Cagliostro, Crème de Celeri,

Liqueur dite de la Grande Chartreuse—Green, Yellow, and White; China-China, Eau de Chine, Eau de la Côte Saint André, Eau de la Côte Aux-Noyaux, Curaçoa (old receipt), Curaçoa Blanc, Curaçoa Surfin, Manufacture of 104 litres of Curaçoa, Spirit of dried ribbons of Curaçoa, Spirit of Oranges, Eau Divine, Eau de Vie d'Andaye, Eau de Vie de Dantzick, Fenouillette de l'ile de Rhé, Crème de Fleurs d'Oranger, Crème de Framboises, Huile de Kirschenwasser, Elixir de Garus, Crème de Genepi des Alpes, Moyorca, Crème de Menthe, Liqueurs dú Mézenee, Crème de Mille-Fleurs, Crème de Moka, Crème de Noisette à la Rose, Crème de Noyaux, Crème de Noyaux de Phalsbourg, Crème d'Oeillets, Eau d'Or, Parfait Amour de Lorraine, Persico, Raspail's Liqueur Hygienique et de Dessert, Huile de Rhum, Crème de Roses, Eau de Sept Graines, Scubac de Lorraine, Crème de Thé de la Chine, Huile de Venus, Eau Verte de Marseille, Vespétro de Montpéllier, Eau Virginal ou de Puculle; West Indian Liqueurs: Baume Divin, Baume Humain, Crème d'Ananas, Crème des Barbades, Crème des Cachou, Crème de Moka, Crème de Noyaux, Crème Sapotille de la Martinique, Huiles de Badiane, Huiles d'Anis des Indes, Huile de Cacao, Huile de Cedrats, Huile de Cannelle, Huile des Créoles, Huile de Girofle, Huile de Rhum, Huile de Vanille, Huile de Zinzibre; Foreign Liqueurs: Anisette de Holland, Curaçoa de Holland, Crème Genièvre de Holland, Liqueur Flamande, Dutch Bitters, Amer de Holland, Veritable Eau de Vie de Dantzick, Franzoesich Wasser de Dantzick, Deutchland Wasser de Breslau, Persicot du Palatinat, Scotch Usquebaugh, English Bitters, Alkermes de Florence, Aqua Bianea de Turin, Aqua d'Oro de Turin, Cedrats di Palermo, La Fioretto de Florenee, La Giovane de Turin, Liquore delle Alpi, Marasehino de Zara, Mirobolano or Myrobolanti, Olio di Cremona, Olio di Maccheroni di Genova, Rosolio di Meta di Pisa, Rosolio di Turino, Rubino di Venezia, Chiraz (a new Persian liqueur); Nomenclature and Receipts for Liqueurs by Infusion, Ordinary Liqueurs: Huile de Vanielle, Bron de Noix, Ratafia de Cassis, Cassis Ordinaire, Ratafia de Framboises, Ratafia de Coings; Liqueurs Doubles: Huile de Vanille, Bron de Noix, Ratafia de Cassis, Ratafia de Framboises; Liqueurs Demi-Fines: Huile de Vanille, Huile de Violettes, Bron de Noix, Ratafia de Cassis, Cassis Demi-Fine, Ratafia de Cerises, Ratafia de Framboises, Ratafia de Quatre Fruits, Ratafia de Coings; Liqueurs Fines: Huile de Vanille, Huile de Violettes, Bron de Noix, Ratafia de Cassis, de Cerises, de Framboises, de Quatre Fruits, de Coings; Liqueurs Surfines: Veritable Liqueur, Hygenique et de Dessert de Raspail, Liqueur Hygenique de Saumeur, Liqueur Stomachique Dorée, Crème de Vanille, de Violette, de Bron de Noix, de Cassis, Ratafia de Cassis de Digin, Crème de Cassis de Touraine, Ratafia de Censes de Grenoble, Ratafia de Grenoble dit de Teyssere, Ratafia de Framboises, Guignolet, D'Angers; Receipts for Preparing Liqueurs by Volatile Oils or Essences without the Use of the Still; Common Liqueurs: Anisette, Eau d'Angélique, Cent Sept Ans, Curaçoa, Fleurs d'Oranger, Menthe (Peppermint), Eau de Noyaux, Parfait Amour, Huile de Roses, Vespétro; Liqueurs Demi-Fines: Anisette, Crème d'Angélique and de Celeri, Cent Sept Ans, Curaçoa, Créme de Fleurs d'Oranger, Crème de Menthe, Crème de Noyaux, Parfait Amour, Huile de Roses, Vespétro; Liqueurs Fines: Anisette, Crème d'Angélique, Crème de Celeri, Cent Sept Ans, Curaçoa, Eau de Vie de Dantzick, Crème de Fleurs d'Oranger, Elixir of Garus, Crème de Menthe, Crème de Noyaux, Parfait Amour, Huile de Roses, Eau des Sept Grains, Vespétro; Liqueurs Surfines: Anisette, Crème d'Absinthe, Crème d'Angélique, Crème de Barbades, Crème de Celeri, Curaçoa, Liqueur dite de la Grande Chartreuse, Eau de Vie de Dantzick, Crème de Fleurs d'Oranger, Elixir de Garus, Huile de Kirschenwasser, Crème de Menthe, Liqueur de Mezanee, Crème de Noyaux de Phalsbourg, Crème de Roses, Eau des Sept Graines. Vespétro de Montpéllier, Anisette de Hollande, Alkernies de Florenee, Marasquin de Zara, Rosolio de Turin, Crème de Jasmin, de Jonquille, d'Heliotrope, de Réséda, de Tubereuse, de Millefleurs. XXV. Cordial Wines: Imitation of Cordial Wines; Spirit of Tar; Infusion of Toasted Bitter Almond Hulls; Receipts for Cordial Wines: Alicanite, Cyprus, Constance, Grenache, Malaga, Malvoiscede, Madére, Muscat de Lunel, Muscat de Frontignan, Madeira, Sherry, Sherry Cordial, Lacryma Christi, Port, Rota, Tokai; Factitious Effervescing Wines: Vermout de Turin, Vermout d'Italie (Receipt of Ollivero), Vermout au Madére. XXVI. New Method of Distilling in a Vacuum.

Appendix.—The Metric System; U. S. Internal Revenue Regulations and Instructions concerning the Tax on Distilled Spirits; Regulations concerning the Distillation of Brandy from Apples, Peaches, or Grapes, exclusively; Additional Exemption in relation to Brandy Distilled from Apples, Peaches, or Grapes, exclusively; Regulations and Instructions relative to Tice Meters; Regulations for the Use of Stamps for Distilled Spirits, the issue of Stamps for Rectified Spirits, and to Provide for a Uniform and Correct Mode of Marking and Branding Casks or Packages of Spirits; Report of the National Academy of Sciences to the Secretary of the Treasury on the Best Method of Proving and Gauging Alcoholic Liquors, with a Manual for Inspectors of Spirits, with Copious Tables.

Dussauce.—A New and Complete Treatise on the Arts of Tanning, Currying, and Leather Dressing:

Comprising all the Discoveries and Improvements made in France, Great Britain, and the United States. Edited from Notes and Documents of Messrs. Sallerou, Grouvelle, Duval, Dessables, Labarraque, Payen, René, De Fontenelle, Malapeyre, etc. etc. By Prof. H. DUSSAUCE, Chemist. Illustrated by 212 wood engravings. 8vo. $25 00

CONTENTS.—INTRODUCTION.

PART I. CHEMISTRY OF TANNING. Section I. Tan and Tannin. Chapter I. Puro Tannin. II. Impure Tannin. III. Artificial Tannin. IV. Tannin from various sources. V. Gallic and Ellagic Acids. VI. Extractive. Section II. Tanning Materials. VII. Tanning Saps; Tanning Juices; Kino; Catechu. VIII. Excrescences containing Tannin. IX. Leaves; Tea; Flowers and Fruits; Seeds and Bulbs. X. Woods; Roots; Barks. XI. Oak Barks. XII. Barking of the Trees. XIII. Plants containing Tannin used as substitutes for Oak Barks. XIV. Methods of Estimating the Tanning Power of Astringent Substances. XV. Tan or Powdered Oak Bark. XVI. Tanning Extracts. Section III. Skin. XVII. Proximate Principles of Leather; Structure of the Skin. XVIII. Constitution of the Skin. XIX. The Proper Treatment of Hides and Skins; Kinds of Skins suitable for Tanning; Salting of the Hides.

PART II. TANNING. Section IV. Preliminary Treatment of Skins. XX. Washing and Soaking. XXI. Influence of the Water upon the Quality of Leather. XXII. Swelling or Raising of the Hides. XXIII. Stacking of the Hides. XXIV. Inconvenience of the Lime Process. XXV. Method of Raising by Acid. XXVI. Depilation by Steam. XXVII. Depilation by Caustic Soda. XXVIII. Depilation by Sulphuret of Calcium and Soda. XXIX. Cool Sweating Process. XXX. Raising by Barley Dressing. XXXI. Wallachia Leather. XXXII. Rye Dressing, or Transylvania Leather. XXXIII. Raising by Sour Tan Liquor. XXXIV. Raising by Yeast. XXXV. Working on the Beam. Section V. Tanning Process. XXXVI. Tan Vats: Wheat's Patent Vat. XXXVII. Heald's Apparatus for Tanning Hides. XXXVIII. Time necessary for Tanning. XXXIX. Proportions of the Bark used. XL. Drying of the Leather. XLI. Beating of the Leather. XLII. Beating and Rolling by Machinery. XLIII. Tissue and Quality of Leathers; their Defects and the way of ascertaining them. XLIV. Belt Leather. XLV. Tanning of Calf-Skins. XLVI. Tanning of Calf-skins for the Preparation of Waxed Calf-skins, by M. René. XLVII. Tanning of Goat and Sheep-skins. XLVIII. Morocco Leather Dressing; Cordovan Leather. XLIX. Tanning of Horse-hides. L. Tanning of Different Skins. LI. Tanning of the Skins of Sheep's Legs for making Tubes without Suture, for covering the cylinders used in Cotton and Wool Spinning. LII. Red Leather. LIII. Danish Process. LIV. Chemical Theory of Tanning. Section VI. Improved Processes. LV. Seguin's Process. LVI. Process of Preparing Glossed Leather before the Tanning operation. LVII. Tanning with Myrtle. LVIII. Tanning with Grape-skins. LIX. Tanning with Statice. LX. Leprieur's Tanning Process. LXI. D'Arcet's Process by the Sulphate of Sesquioxide of Iron. LXII. Newton's Process. LXIII. Preparing Dry Flint Hides. LXIV. Process of Tanning of H. C. Jennings. LXV. Berenger and Sterlingue's Process. LXVI. Corniguet's Process of Substituting the Fruit of the Pine for the Bark in Tanning. LXVII. Vauquelin's Process. LXVIII. Ogreau's Process. Section VII. American, English, and other Processes. LXIX. Process of Tanning with a Decoction of Oak Bark. LXX. Desmond's Process. LXXI. J. Burbidge's Process with Extract of Oak Bark and Catechu. LXXII. Kleman's Process. LXXIII. Spilsbury's Process by Pressure. LXXIV. M. W. Drake's Process. LXXV. Rotch's Quick Process of Tanning Leather. LXXVI. J. F. Knowlis's Process. LXXVII. Tanning Apparatus of D. Aldrich, of St. Louis, Mo. LXXVIII. Tanning Wheel of V. E. Rusco. LXXIX. New Mode of Tanning Skins by a Liquor of Tar and Soot. LXXX. Indian Method of Preparing Elk Hides. LXXXI. Hatch's Process of Tanning, called Illinois French Tanning. LXXXII. Irish Process. LXXXIII. Process of Manufacturing Leather called Cuirs à Muron. LXXXIV. Kalmuck's Process. LXXXV. Lea-

ther Manufacture in Turkey. LXXXVI. J. Hannoye's Process. LXXXVII. M. Nossiter's Process. LXXXVIII. Squire's Process. LXXXIX. English Process for Tanning Nets, Sails, and Ropes. XC. Experiments in the Tanning of Calf-skins with Tan, Dividivi, Catechu, and Elecampane Bark. XCI. Tanning Hides, by J. W. Johnson. XCII. Turnhull's Process. XCIII. S. Snyder's Process. XCIV. H. Hibhard's Process. XCV. Hemlock Tanning. XCVI. Halvorson's Process for rendering Hides hard and transparent. XCVII. Tawing. XCVIII. The best method of Tanning Small Lamb-skins called Chamois, and especially White Peltry for Furriers. XCIX. New Method of Coloring White Tawed Leather. C. Quick Tanning. CI. Residues and Products of Tanneries.

PART III. CURRYING. Section VIII. General Work of the Currier. CII. Dipping. CIII. Shaving. CIV. Pommelling. CV. Stretching. CVI. Working with the Round Knife. CVII. Preparation of Stretched Leather. CVIII. Preparation of Sleeked Leather. CIX. Comparison of Sleek Leather with Alum-dressed Leather. CX. Tallowed or Grained Leather. CXI. Water Leather. CXII. Oil Leather: Oiled Leather. CXIII. Waxed Leather. CXIV. English Hides. CXV. White Leather and Common Russet. CXVI. Currying of Calf-skins; Oiled Calf-skins. CXVII. Tallowed Calf-skins. CXVIII. English Calf-skins. CXIX. Waxed Calf-skins. CXX. Grained Calf-skins. CXXI. Calf-skin Leather for Belts. CXXII. Greasing Tanned Hides. CXXIII. Saturation of Leather with Grease. CXXIV. Calf-skins called Alumed Skins. CXXV. F. Jahkel's Process for Manufacturing Leather for Harness Makers. CXXVI. Currying of Goat-skins. Section IX. Russia Leather. CXXVII. Process of Manufacturing Russia Leather. CXXVIII. Distillation of the Empyreumatic Oil of Birch-bark for Russia Leather. CXXIX. Nature of the Odoriferous Substances of the Birch-tree Bark. CXXX. Preparation of Russia Leather. CXXXI. Coloring of Red Russia Leather. CXXXII. Extract from a Memoir on the Process of Tanning Skins in Russia by the Count of Kartsoff. CXXXIII. Red Leather. CXXXIV. Shagreen and Parchment: Shagreen. CXXXV. Parchment. Section X. Patent Leather. CXXXVI. Fabrication of the Patent Leather. CXXXVII. Didier's Process. Section XI. Water-proof Leather. CXXXVIII. Process of J. Smith and J. Thomas. CXXXIX. Nenory's Preparation to render Leather Water-proof and Impervious. CXL. Dean's Process for rendering Leather Impervious. CXLI. Different Processes.

PART IV. HUNGARY LEATHER. Section XII. Chap. CXLII. Grease and Animal Oils CXLIII. River Work. CXLIV. Aluming the Hides. CXLV. Second Aluming. CXLVI Drying and Stretching. CXLVII. Treading out the Hides. CXLVIII. Tallowing. CXLIX. Flaming. CL. Exposure to the Air. CLI. Weighing; Marking; Piling. CLII. Hungary Leather made of Cow and Calf-skins. CLIII. Hungary Leather made of Horse-hides. CLIV. M. Kresse's Process of Preparing Black Hungary Leather. CLV. Defects in the Quality of Hungary Leather. CLVI. Uses of Hungary Leather. CLVII. Improvement of M. Curandeau.

PART V. GUT-DRESSING. Section XIII. Preparation of the Intestines of Cattle. CLVIII. Operations followed in the Preparation of Intestines of Cattle. CLIX. Disinfection of the Workshops; Mode of Suppressing Putrefaction. CLX. Goldbeater's Skin. CLXI. Lathe-Cords. CLXII. Manufacture of Cords from the Intestines of Sheep. CLXIII. Different Cords. CLXIV. Cords for Musical Instrument Strings.

PART VI. DIFFERENT KINDS OF APPARATUS USED BY LEATHER MANUFACTURERS. CLXV. Improved Machine for Rolling Green or Wet Leather. CLXVI. Machines for Finishing Leather. CLXVII. Leather Polishing Machine. CLXVIII. Jacob Perkins's Machine for Pommelling and Graining Leather. CLXIX. Nishet's Grounding and Pumacing Machine. CLXX. Embossing of Leather. CLXXI. Degrand's Machine for Splitting and Shaving Leather. CLXXII. Giraudon's Machine for Splitting and Shaving Leather. CLXXIII. Machines for Splitting and Shaving Leather.

Dussauce.—A General Treatise on the Manufacture of Every Description of Soap:

Comprising the Chemistry of the Art, with Remarks on Alkalies, Saponifiable Fatty Bodies, the apparatus necessary in a Soap Factory, Practical Instructions in the manufacture of the various kinds of Soap, the assay of

Soaps, etc. etc. Edited from Notes of Larmé, Fontenelle, Malapayre, Dufour, and others, with large and important additions by Professor H. Dussauce, Chemist. Illustrated. In one volume, 8vo. . . . $10 00

Contents.—Glance at the History of the Art.

Section I. Elementary Notions of Chemistry. Chapter I. General Principles: Phenomenon of Chemical Combination; Definition of Chemistry; Affinity, Simple and Compound Bodies; Cohesion. II. Nomenclature; Simple Bodies; Compound Bodies; Binary Oxygenated Compounds; Acids; Oxides; Ternary Oxygenated Compounds; Hydrogenated Binary Compounds; Hydrates; Binary Compounds formed of two Simple Bodies; Sulphuretted Ternary Compounds; Binary Combinations of Metals; Symbols; Metalloids: Metals. III. Equivalents: Law of Weights; Law of Definite Proportions; Law of the Multiple Proportions; Law of Chemical Equivalents; Law of Wenzel; Law of Richter; Law of Berzelius; Determination of the Equivalents; Isomorphism; Table of the Equivalents of the Simple Bodies. IV. Chemical Reactions: Different Cases of Reactions; Action of Acids on Salts; Action of Bases on Salts; Action of Salts on each other; General Formulæ. V. Special Characteristics of the Different Classes of Bodies: Metalloids; Metals; Classification of Metals; Acids; Oxides; Hydrates; Chlorides; Bromides; Iodides; Fluorides; Cyanides; Sulphides; Chlorates; Hypochlorites; Sulphates; Sulphites; Hyposulphites; Salts of the Thionic Series; Nitrates; Phosphates; Arseniates; Arsenites; Carbonates; Borates; Silicates.

Section II. Raw Materials used in the Manufacture of Soaps. VI. Lime. VII. Potash: Potassium; Potash; Comparative Table of the Quantities of Ashes and Potash contained in different Vegetables; Extraction of Potash; Combustion of the Plants in Furnaces; Leaching or Washing of the Ashes; Red American Ashes; Asbes made from Tartar; Potash made from Beet-root Molasses; Composition of Commercial Potashes; Purification of Potash. VIII. Soda: Sodium; Combinations of Sodium with Oxygen; Hydrate of Soda; Soda; Natural Sodas; Soda of Narbonne, Soda of Aigues-Mortes; Soda from Sea-weeds; Spanish Sodas; Mixed Barilla; Salted Barilla; Natron; Artificial Soda; History of the Fabrication of Artificial Soda; Fabrication of Crude Soda; Sulphate of Soda; Mixture; Calcination; Artificial Salted Soda; Refined Carbonate of Soda; Crystallized Carbonate of Soda or Crystals of Soda; Caustic Salts of Soda. IX. Ammonia. X. Alkalimetry. Assays of Potashes and Sodas; Method of Descroizilles; Preparation of the Alkalimetric Liquor; Saturation; Table of Alkalimetric Results obtained by Descroizilles; Soda and Derivates; Assays by the Perfected Method of Gay-Lussac; Method of ascertaining the Quantity of Caustic Alkali contained in Potashes and Caustic Salts of Soda; Preparation of Lyes; Example; Table of pure Potash contained in one Litre of Lye of Potash; Table of Quantity of Pure Soda contained in one Litre of Soda; Four Tables of different Areometric Degrees which result from the mixture of different quantities of Lye of Salt of Soda with various quantities of Water. XI. Acids: Carbonic Acid; Sulphuric Acid; Hydrochloric Acid; Nitric Acid.

Section III. Fatty Substances used in the Fabrication of Soaps. XII. General Observations on Fatty Substances: Division of Fatty Bodies; Extraction of Fatty Bodies: Vegetable Oils; Virgin Oil; Quantity of Oil furnished by Seeds; Purification of Vegetable Oils; Extraction of Animal Oils; Purification of Fish Oils; Extraction of Greases and Tallows; Extraction of Animal and Vegetable Waxes; Properties of the Fatty Substances; Immediate and Elementary Composition; Properties of the Immediate Principles; Elementary Composition; Action of Heat; Alkalies and Acids; Uses of Fatty Bodies. XIII. Immediate Principles of Fatty Bodies: Stearin; Margarin; Olein; Elaidin; Butyrin; Phocenin; Palmin; Palmitin; Myristin; Hircin; Cetin; Myricin; Cerin; Cerolein; Ethal; Cholesterin; Glycerin. XIV. Fatty Acids: Stearic Acid; Margaric Acid; Oleic Acid; Elaidic Acid; Butyric Acid; Capric Acid; Caproic Acid; Phocenic Acid; Palmic Acid; Palmitic Acid; Hircic Acid; Heintz's Table of Melting and Solidifying Points of Mixtures of the Acids. XV. Action of Acids on Fatty Bodies. XVI. General Considerations on Fixed Oils: Table of Fixed Oils; Table of the Quantities of Oils which may be extracted from Vegetables; Physical Properties of Oils; Specific Gravity of Oils; Chemical Properties; Combustibility of Oils; Solubility of Fixed Oils. XVII. Fixed Oils: Olive Oil; Oil of Sweet Almonds; Hazelnut Oil; Rapeseed Oil; Coleseed Oil; Sesame Oil; Earth-nut Oil; Cameline Oil; Beech Oil; Cotton Seed Oil; Ben Oil; Linseed Oil; Black Poppy Oil; Hempseed Oil; Nut Oil; Castor Oil. Concrete Oils: Palm Oil; Coco Oil; Oil of Cacao; Butter of Nutmegs; Tallow of Virola; Oil of Laurel; Butter of Galam; Vegetable Tallow. XVIII. Animal Greases: Greases; Butter; Lard; Lard Oil; Rendering by Steam—Wilson's Process; Beef Marrow; Tallows; Bone Tallow; Horse Grease; Green Greases; Tallows; Sheep Tallow; Beef Tallow; Veal Tallow; Tripe Tallow; Extraction of Tallow—French Process—American Process—D'Arcet's Process; Rendering by the Still—Ev

rard's Process—Stein's Process; Extraction of Fatty Bodies from Soapy Waters; Animal Oils; Neat's Foot Oil; OILS OF CETACEI: Whale Oil; Cachalot Oil; Porpoise Oil. FISH OILS: Commercial Fish Oils: Cod-Liver Oil. XIX. WAXES, RESINS, TURPENTINES: Animal Wax; Beeswax; Vegetable Waxes; Palm Tree Wax; Carnauba Wax; Myrtle Wax; Ocuba Wax; Wax of Bicuida; Resins; Turpentines; Turpentine of Venice; Switzerland Turpentine; Turpentine of Bordeaux; Boston Turpentine; Turpentine of Canada (Canada Balsam); Preparation of a Purified Rosin for Soaps. XX. FALSIFICATIONS AND ASSAYS OF FATTY MATTERS: Alterations; Falsifications; Olive Oil: Oil of Sweet Almonds; Rapeseed Oil; Colewort Oil; Sesamum Oil; Linseed Oil; Black Poppy Oil; Hempseed Oil; Castor Oil; Neat's Foot Oil; Oleic Acid; Palm Oil; Oil of Cacao; Butter of Nutmegs; Assay of Oils; Qualitative Assays: First Process, Table A; Second Process, Table B; Third Process, Fourth Process, Table C; Assay of the Oils for Manufactures. OLEOMETRY, ASSAY BY VOLUMES; Mixture of Olive and Earth-nut Oils; Olive and Sesamum Oils; Olive and Colewort Oils; Colewort and Linseed Oils; Sesamum and Earth-nut Oils; Assays by Weight; First, second, and third Solutions; First, second and third Combinations; Falsifications of Lard; Alterations; Falsifications: Falsifications of Tallows; Falsifications of Waxes; Yellow Wax and Sulphur; Yellow Wax and Yellow Ochre; Yellow and White Wax and Calcined Bones; Wax and Resins, Pitch, &c.; Wax and Starch, or other Amylaceous Substances; Wax and Tallow; Wax and Stearin; Wax and Stearic Acid; Wax and Water; Falsifications of Spermaceti. XXI. VOLATILE OILS, RESINS: Table of the Principal Volatile Oils; Resins; Colophony or Common Rosin.

SECTION IV. ESTABLISHMENT OF A SOAP FACTORY. XXII. KETTLES: Masonry Kettles; Cast-Iron Kettles; Sheet-Iron Kettles; Heating of Kettles by Fire; Heating of Kettles by Steam; Steam Series—Morfit's System; Hubert's Apparatus for Boiling Soap; Morfit's Steam Twirl. XXIII. LYE VATS; Bogardus's Eccentric Mill. XXIV. SOAP FRAMES: Frames of Masonry; Frames of Iron; Frames of Wood. XXV. DRYING ROOMS: Drying Room with Warm Air. XXVI. DIVIDER, MOULDING MACHINE, AND MINOR IMPLEMENTS. XXVII. PLAN AND DESCRIPTION OF A SOAP FACTORY: Establishment and General Arrangement of a Soap Factory; Kettles; Fireplace; Grate; General Chimney; Ash Pan; Cisterns in Masonry; Large Masonry Vats; Cellars; Basins; Frames; Store Rooms; Description of a General Plan for a Soap Factory heated by Steam.

SECTION V. FABRICATION OF SOAPS. XXVIII. THE THEORY OF SAPONIFICATION: Saponification by Acids, by Heat, by Ferments. XXIX. THE PREPARATORY MANIPULATIONS IN THE PROCESS OF MAKING SOAP: Preparation of the Lyes; Lye for Wood Ashes; Lye for Soda Ash; Steam Lyes; Paste Operation; Clarifying or Finishing Operation; Mottling Operation; Cooling Operation; Cutting Operation; Drying Operation. XXX. FABRICATION OF MARBLED SOAP: Preparation of the Lyes; Preparation of the Salted Lyes; Pasting; Separation; Coction; Mottling; Causes which produce Mottling; Cutting; Re-melting of the Soap; Quantities of Soap furnished by Oils; Regeneration of Old Lyes. XXXI. WHITE SOAP FROM OLIVE OIL: Pasting; Separation; Coction; Liquidation. XXXII. SOAP MADE WITH BONE TALLOW: Pasting and Separation; Coction; Liquidation. XXXIII. SOAPS MADE WITH OLEIC ACID: Preparation of the Lye; First Process: Pasting; Separation; Coction; Liquidation; Running; Amount of Soap obtained; Second Process: Pasting; Coction; Liquidation; Storing the Soap in the Frames; Third Process: Liquidation. XXXIV. RESINOUS SOAPS: First Process: Separation; Coction; Liquidation; Resinous Soaps; Second Process: English Method; Another Process; Dunn's Process. XXXV. SOAPS OF COCO OIL: White and Rose Soaps; Gray Soaps; Yellow Soaps. XXXVI. SOFT SOAPS: Preparation of the Lye of Potash; First Process, for the Fabrication of the Soap; Crown Soap, First Quality, Second Quality; "Green Soap"; Russian Soap; Medicinal Soft Soap; Bran Soap; Oleic Soft Soap; White Soft Soap; "Economic Soap;" Soda Soft Soaps: White Soft Soap; Soap for Silks and Prints; Conversion of Soft Soap into Hard. XXXVII. SILICATED SOAPS: Sand Soap; Silica Soap from Liquor of Flints; Sheridan's Process; Gossage's Process; Dunn's Silicic Soap; Guppy's Process; Davis' Alkalumino Silicic Soap; Soap with Silicate of Soda. XXXVIII. NEW PROCESSES: Process of Mege Mouries; Pelouze's Process; Saponification by Pressure; Saponification by Agitation; Bennett & Gibbs' Improved Method (1865).

SECTION VI. TOILET SOAPS. XXXIX. WHITE TOILET SOAP WITH LARD: Purification of the Grease; Saponification or Pasting; Separation; Coction; Liquidation. XL. SOAP OF TALLOWS: Pasting; Separation; Coction; Liquidation; Purification of ordinary White Soap. XLI. PALM OIL SOAP: Pasting; Separation; Coction; Liquidation. XLII. HALF PALM SOAP: Pasting; Separation; Coction; Liquidation. XLIII. COCO OIL SOAPS: Preparation of the Lye; Fabrication of the White Soap; Rose Soap of Coco Oil; Yellow Soap of Coco and Palm Oils; Gray Soap of Coco and Palm Oils. XLIV. SOAPS BY THE COLD PROCESS: Preparation of the Lye; White Soap; Rose

Soap; Yellow or Marshmallow Soap; Windsor Soap for Shaving; Lard Soap; Beef Marrow Soap; Sweet Almond Oil Soap (Medicinal Soap); Hawes' Soap; Macquer's Soap; Extempore Soap by D'Arcet, Pelletier, and Lelièvre; Chemical Olive Soap; Red Oil or Oleic Soap; Formulæ for Perfumed Soaps; Savon Fleur d'Italie; Savon Jonquille; Savon Benjoin; Savon Ambré; Savon Millefleurs; Savon au Miel d'Angleterre; Savon à la Marechale; Savon au Bouquet; Savon au Suc de Concombre; Soap of Coco Oil; Savon Mousseaun de Guisnée; Savon Hygiénique: Savon Angdalin or Suc Lacteux du Framboises; Savon Cold Cream Solidifié; Savon à la Rose, Nos. 1, 2, 3, 4; Savon aux Violettes des Bois; Savon aux Violettes de Panne; Savon Hygienic, extra fine; Savon Imperial; Savon à la Mousseline; Savon Musc; Savon Medicinal; Rinter's Table showing the Composition and Product of Soap by the Cold Process from Concentrated Lye. XLV. Floating Soaps. XLVI. Powdered Soaps: Poudre de Savon de Windsor; Poudre de Savon au beurre de Galan; Poudre de Savon Oncluese; Poudler de Savon Parfumée a teule. XLVII. Essence of Soap: Various Formulæ. XLVIII. Transparent Soaps. XLIX. Soft Toilet Soaps or Almond Cream: Various Formulæ; Windsor Soaps, six varieties. L. Savonettes: Form of the Savonettes; Color of the Savonettes; Common Savonettes; Marbled Savonettes; Savonettes aux fines Herbes; à l'Oeillet; à la Vanille; à l'Ambré; au Musc; à la Bergamotte; au Nevoli; au Seroeul; au Miel; Light Savonette; Savonettes de Boulogne. LI. Different Preparations of Toilet Soaps: New Apparatus for the Manufacture of Toilet Soaps, 20 different Formulæ.

Section VII. Different Manipulations to which the Pastes of Crude Soaps are Subjected to be Transformed into Toilet Soaps. LII. The Cutting Machine. LIII. Grinding Machine. LIV. Mortar in which to Pound the Soap. LV. Moulds and Presses. LVI. Fabrication of the Toilet Soap: Reduction of the Soap into Shavings; Mixture of Oils and Colors with the Soap; Grinding the Soap; Pounding the Soap; Balling the Soap. LVII. Formulæ for Perfuming and Coloring Toilet Soaps: 20 Formulæ; Wrapping of Toilet Soaps.

Section VIII. Formulæ for Pressing Different Kinds of Soap, and Improvements in the Fabrication. LVIII. Preparation of Different Kinds of Soap: Liquid Soap of Chaptal; Family Soap; Soap to Bleach Cotton Thread; Soap from Beef Marrow; from Rancid Butter; from Horse Grease; from Wool; of Lime; of Magnesia; of Alumina; of Wax; Ammoniacal Soap; Starkey's Soap; Action of Caustic Alkalies on Essential Oil of Cloves and Oil of Pimento; Animal Soaps; Bernadet's Process; C. J. Willart's Process; Crevel's Process; Coffignon's Process; Villacrue's Process; Use of Bones in the Fabrication of Soap; Oil and Syrup of Soap, a New Soft Soap, 3 Processes; Soap by Machinery; Soap with Gelatine, by Aubonnet; Toilet Soap of Guerlain; Soap of Turpentine by Marley; Palm and Coco Oil Soaps, Junot's Process; Palm Oil Soap of M. F. Violet; White Palm Soap by M. C. Vallée. LIX. Improvements in the Fabrication of Soaps: Improved Soaps of Rotch and Davis; Soap to remove Stains; Michler's Soap; Argillaceous Soap by J. Douglass; Soap with Lichen by M. J. Levot; Will's Soap; Piesse's Medicated Soap. LX. Substitutes for Soap: Potatoes; Vegetable Soap of Jamaica; Soap Tree; Soap Wart; Liquid used as a Substitute for Soap; Process to remove Sea Water. LXI. On the Changes to be made in the Actual Process of Saponification, by M. Darcet.

Section IX. Analysis and Assay of Soaps. LXII. Determination of the Proportions of Water. LXIII. Determination of the Proportions of Fatty Acid. LXIV. Determination of the Proportions of Alkalies. LXV. Determination of the Proportions of Foreign Substances. LXVI. Special Methods of Analyzing Soaps: Rampal's Process; Carlletel's Process. LXVII. Different Methods of Determining the Commercial Value of Soap: Muller's Process; Dr. Buchner's Process; Groeger's Process.

Appendix.—Extracts from the Reports of the International Jury of the Paris Exposition of 1867, on Soaps and the Raw Materials for Soaps: Weights and Measures; French Weights and Measures; Hydrometers; Thermometers; Table showing the Quantity of Anhydrous Potash in Caustic Potash Lye; Gerlach's Table, showing the Quantity of Carbonate of Soda in its Solutions; Table showing the Quantity of Caustic Soda in Soda Lye; Schiff's Table, showing the Quantity of Crystallized and Anhydrous Soda in Solutions of Carbonate of Soda. Index.

Dussauce.—A Practical Guide for the Perfumer:

Being a New Treatise on Perfumery the most favorable to the Beauty without being injurious to the Health, comprising a Description of the

substances used in Perfumery, the Formulæ of more than one thousand Preparations, such as Cosmetics, Perfumed Oils, Tooth Powders, Waters, Extracts, Tinctures, Infusions, Spirits, Vinaigres, Essential Oils, Pastels, Creams, Soaps, and many new Hygienic Products not hitherto described. Edited from Notes and Documents of Messrs. Debay, Lunel, etc. With additions by Professor H. Dussauce, Chemist. 12mo. . . $5 00

Contents. Section I.—Preliminaries. Chapter 1—Odors and Perfumes. 2—History of Perfumes. 3—Manipulations—Decoction—Infusion—Dissolution—Maceration—Filtration—Decantation—Discoloration—Epuration—Distillation—Conservation and drying of flowers—Bleaching of sponges—Conservation of perfumes. 4—Enumeration and description of the most usual perfumes.

Sec. II.—Natural Essential Oils. 5—Natural state of essential oils—Their mode of formation—Their general properties—Classification—Adulterations. 6—Extraction of essential oils—By distillation—Distillation of light oils—Distillation of heavy oils—Distillation by reaction—By impregnation—By expression. 7—Essential oils the most used in perfumery.

Sec. III.—Artificial essential oils. 8—Artificial oils—Oil of brandy and wine—Oils of rum—Strawberry—Pineapple—Pear—Apple—Apricot—Melon—Quince—Cucumbers—Lemon—Nitro-benzine—Table.

Sec. IV.—Distilled waters. 9—Formulæ of distilled waters.

Sec. V.—Alcoholates or spirits—Tinctures. 10—Spirits. 11—Aromatic tinctures. 12—Compound tinctures.

Sec. VI.—Alcoholic extracts of flowers with fugitive odors. 13—Processes for the manufacture of extracts.

Sec. VII.—Mixtures of extracts and aromatic tinctures to obtain scented waters. 14—Formulæ for scented waters.

Sec. VIII.—Compound perfumes and cosmetics most employed. 15—Perfumed alcoholates. 16—Bouquets and nosegays. 17—Perfumes for pastes and pomades.

Sec. IX.—Vinegars. 18—Toilet vinegars.

Sec. X.—Milks and lotions. 19—Milks. 20—Lotions.

Sec. XI.—Dentifrices. 21—Waters. 22—Dentifrice powders. 23—Opiates.

Sec. XII.—Cosmetic pastes—Powders—Troches—Sachets. 24—Pastes. 25—Powders. 26—Cassolettes—Potpourri—Trochists pastils.

Sec. XIII.—Fatty substances used in perfumery. 27—Oils—Greases—Wax. 28—Epuration and preparation of greases for pomade bodies.

Sec. XIV.—Pomades—Cream cerates—Cold creams—Serkis, etc. 29—Pomades. 30—Pomades, with essential oils. 31—Perfumed hair oils. 32—Anticalvitic and regenerative pomades. 33—Cosmetic pomades for the skin.

Sec. XV.—Depilatories. 34—Formulæ for Depilatories.

Sec. XVI.—Whites and Reds. 35—Whites—Bismuth—Whites of Bismuth—Ceruse, or whites of lead—White of zinc—White of talc—White of baryta. 36—Reds—Carthamine—Garancine—Cochineal—Carmin—Carmine—Bresiline—Different forms of red.

Sec. XVII.—Soaps. 37—Preparation of soap. 38—Toilet soaps.

Sec. XVIII.—Baths. 39—Cosmetic Bath.

Sec. XIX.—Hair dyes. 40—Formulæ for hair dyes. 41—Economical scents—Flavoring extracts. 42—New and perfected products.

Dussauce.—Practical Treatise on the Fabrication of Matches, Gun Cotton, and Fulminating Powder.

By Professor H. Dussauce. 12mo. $3 00

Contents.—*Phosphorus*—History of Phosphorus; Physical Properties; Chemical Properties; Natural State; Preparation of White Phosphorus; Amorphous Phosphorus and Binoxide of Lead. *Matches*—Preparation of Wooden Matches; Matches Inflammable by rubbing, without noise; Common Lucifer Matches; Matches without Phosphorus; Candle Matches; Matches with Amorphous Phosphorus; Matches and Rubbers without Phosphorus. *Gun Cotton*—Properties; Preparation; Paper Powders; use of Cotton and Paper Powders for Fulminating Primers, etc.; Preparation of Fulminating Primers, etc. etc.

Dussauce.—A General Treatise on the Manufacture of Vinegar:

Theoretical and Practical. Comprising the various Methods, by the Slow and the Quick Processes, with Alcohol, Wine, Grain, Malt, Cider, Molasses, and Beets; as well as the Fabrication of Wood Vinegar, etc. etc. By Prof. H. Dussauce. In one vol. 8vo. $5 00

Contents.—Introduction. Historical Notice.

Section I.—Chemical Principles. Chapter I. General Principles of Chemistry: Definitions, Distinction of Bodies in Animals, Vegetables and Minerals, Molecules, Atoms, Particles, Pores, Cohesion, State of Bodies, Solids, Liquids, Gases, Division of Bodies into Simple and Compound, Analysis and Synthesis, Reagents, Chemical Combination, Affinity, Definite and Multiple Proportions, Generalities in Organic Chemistry. II. Elementary Principles: Cellulose, Starch, Dextrine, Glucose, Gums, Sugars. III. Alcohol: Alcoholic Fermentation, Ferment, Alcohol, Preparation, Properties. IV. Art of Brewing: Malting, Steeping, Couching, Flooring, Drying, Brewing, Grinding, Mashing, Boiling, Cooling, Fermenting, Cleansing. V. Acetic Fermentation. VI. Acetic Acid: Table of M. Oudeman, showing the densities of Acid formed at different temperatures. VII. Different Methods of Preparing Concentrated Acetic Acid: Pérès' Process, Lartigue's Process, Baup's Process, Lowitz's Process, Acetic Acid obtained by the Decomposition of the Acetates and by Distillation, Preparation of Acetic Acid by the Acid Acetate of Potash by M. Melsens, Preparation of Concentrated Acetic Acid with Acetate of Soda and Pyrolignite of Lime by M. K. Christt, Beringer's Process, Sebille Auger's Process, Process to obtain Crystallizable Acetic Acid by Despretz, Fabrication of Pure Acetic Acid and Acetates with Pyroligneous Acid and Baryta. VIII. Derivatives of Acetic Acid: Aldehyde, Acetone, Acetic Ether. IX. Metallic Acetates: Acetates, Acetate of Potassa, of Soda, of Ammonia, of Baryta, of Strontia, of Lime, of Alumina, of Magnesia, of Manganese, of Iron, of Zinc, of Tin, of Cobalt, of Nickel, of Lead, of Copper, of Copper and Lime, of Mercury, of Silver, Table of the less important Acetates. X. Saccharometry: Tables. XI. Alcohometry: Tables. XII. Hydrometers: Tables.

Section II.—Wine and Cider Vinegars. XIII. Generalities on the Fabrication of Vinegars. XIV. Vinegar Mother or Ferment. XV. Wine: Grape Juice, Analysis of Wine, Tables of Alcohol in different Wines. XVI. Different Modes of Manufacturing Vinegar: Boerhaave's Method, Flemish Method, Orleans Method, Household Process, Method of the North of France, Spanish Method, Parisian Method, French Process. XVII. Cider Vinegar. XVIII. Fabrication of Vinegar with Alcohol and Whiskey.

Section III.—Malt Vinegar. XIX. Preparation of the Fermented Liquor. XX. Transformation of the Fermented Liquor into Vinegar.

Section IV.—Quick Process. XXI. Old Method. XXII. Apparatus. XXIII. General Details of the Operation: Bringing the Generators into Action, Preparation of the Vinegar with Alcohol or Whiskey, Precautions to be taken during the Quick Process. XXIV. Fabrication of Vinegar with Grain and Malt: Description of the Filter, The Filtering Frames, Working of the Filter. XXV. Fabrication of Vinegar with Grain Alone. XXVI. Different Kinds of Vinegars: With Alcohol, Of German Brandy, By Alcohol and Water by MM. Rivière and Durand, Of Sugar, Starch Vinegar; Vinegar made of Sweet Waters, Raisins, Feculæ, etc., by MM. Guenay and Houel; Vinegar with Cane Sugar, Vinegar with Honey, Vinegar of Molasses, Of Beer, Ale Vinegar, Cider Vinegar, Perry Vinegar, Strong's American Vinegar Generator, Fabrication of Beet Vinegar, Leplay's Process, Extraction of the Acetic Acid from the Fermented Slices of Beet, Transformation of Beet Juice into Vinegar; Fabrication of Vinegar with Beet Juice and Residuum, by MM. Ruez, Delsaux, and Vanwormhonde; Fruits Vinegar, Rags Vinegar, Sea-weeds as a Source of Acetic Acid by M. I. Stenhouse. XXVII. Improvements in the Quick Process: Processes of Ure, Ham, Dingler, Anthon, Knapp, New Generator of Dr. Spitaler by M. Schweinberg, Pasteur's Process, Tilden's Improvement in the Generator, The Editor's Process. XXVIII. Improving the Vinegar: Decolorizing, Coloring, Clearing, Flavor and Odor.

Section V.—Wood Vinegar. XXIX. Different Processes for Distilling Wood: Generalities, English Apparatus, French Apparatus, Reichenbach's Apparatus, Apparatus to Extract Pyroligneous Acid from Sawdust, Different Modifications, Proportions of Acid and Charcoal in various kinds of Wood, Tables of Woods and their Products. XXX. Purification of the Products of the Distillation: Wood Naphtha, Purification of Wood Vinegar.

SECTION VI.—APPLICATIONS OF VINEGAR. XXXI. Aromatic Vinegar and Concentrated Vinegar. XXXII. Compound Vinegars: Table Vinegars, Aromatic Distilled Vinegars, Toilet Vinegars, Medicinal Vinegars. XXXIII. Conservation of Alimentary Substances: Preservation of Animal Substances, Preservation of Vegetable Substances.
SECTION VII.—ACETOMETRY. XXXIV. Acetometry: Degree of Concentration of Vinegars, and means to ascertain it; Acetometer of the Parisian Merchants, Descroizille's Acetometer, Fresenius' and Will's Process, Otto's Process, Fleck's Process, Salleron's and Revels' Process, H. Pohl's Process, Process by Carbonated Alkalies, Tables. XXXV. Adulterations in Vinegars: Sulphuric Acid in Vinegar, Hydrochloric Acid in Vinegar, Nitric Acid in Vinegar, Tartaric Acid in Vinegar, Metallic Salts in Vinegar. INDEX.

De Graff.—The Geometrical Stair-Builders' Guide:

Being a Plain Practical System of Hand-Railing, embracing all its necessary Details, and Geometrically Illustrated by 22 Steel Engravings; together with the use of the most approved principles of Practical Geometry. By SIMON DE GRAFF, Architect. 4to. $5 00

DeKoninck.—Dietz.—A Practical Manual of Chemical Analysis and Assaying:

As Applied to the Manufacture of Iron from its Ores, and to Cast Iron, Wrought Iron, and Steel, as found in Commerce. By L. L. DE KONINCK, Dr. Sc., and E. DIETZ, Engineer. Edited with Notes, by ROBERT MALLET, F.R.S., F.S.G., M.I.C.E., etc. American Edition, Edited with Notes and an Appendix on Iron Ores, by A. A. FESQUET, Chemist and Engineer. One volume, 12mo. $2 50

CONTENTS.—Authors' Preface. Editor's Preface. Plan of the work.
PART I. REAGENTS. CHAP. I. Simple Solvents: Water, Alcohol, Ether. II. Elementary Bodies: Hydrogen, Chlorine, Bromine and Iodine, Oxygen, Iron, Zinc, Tin. III. Acids: Hydrochloric Acid, Nitric Acid, Aqua Regia, Sulphuric Acid, Hydrosulphuric Acid, Acetic Acid, Oxalic Acid, Succinic Acid, Tartaric Acid, Sulphurous Anhydride, Carbonic Anhydride, Molybdio Anhydride. IV. Bases: Potass, Soda, Ammonia, Lime, Alumina, Oxide of Lead, Oxide of Copper. V. Alkaline Salts: A.—Salts of Potassinm, Nitrate of Potassium, Sulphate of Potassinm, Carbonate Potassium, Black Flux, Chlorate of Potassium, Permanganate Potassium, Sulpho-cyanate Potassium. B.—Salts of Sodium, Chloride of Sodium, Sulphuret of Sodium, Nitrate of Sodium, Sulphite of Sodium, Carbonate of Sodium, Metaborate of Sodium, Phosphate of Sodium, Acetate of Sodium, Succinate of Sodium, Nitroprusside of Sodium. C.—Salts of Ammonium, Chloride of Ammonium, Hydrosulphide of Ammonium, Molybdate of Ammonium, Sesquicarbonate of Ammonium, Acetate of Ammonium, Oxalate of Ammonium, Neutral Succinate of Ammonium. VI. Salts of the Alkaline Earths: A.—Salts of Barium, Chloride of Barium, Nitrate of Barium, Carbonate of Barium, Acetate of Barium. B.—Salts of Calcium, Chloride of Calcium, Carbonate of Calcium. C.—Salts of Magnesium, Sulphate of Magnesium. VII. Metallic Salts: Nitrate of Silver, Chloride of Nickel, Chloride of Copper, Sulphate of Copper, Nitrate of Lead, Acetate of Lead, Chloride of Mercury, Chloride of Tin, Protosulphate of Manganese, Perchloride of Iron, Sulphate of Iron and Ammonium. VIII. Test Papers, Blue Litmus Paper, Red Litmus Paper, Salt of Lead Paper, Observations.
PART II. APPARATUS AND OPERATIONS. Balances, Weights, Weighing Drying-bell, Weighed Filters, Calcination, Ashes of Filters, &c., Apparatus for Measuring Liquids: Flasks, Tubes, Glasses, Matrasses, Pipettes, Burettes; Filtration, Desiccating Stoves, Sand Bath, Water Bath, Apparatus of Platinum, Muffle Furnaces, Selections of Specimens for Assay.
PART III. VOLUMETRIC ANALYSIS OF IRON. 1. By means of Permanganate of Potassium. 2. By means of Protochloride of Tin.
PART IV. ANALYSIS OF IRON ORES. CHAP. I. Ores not containing Manganese. II. Ores containing Manganese. Separation of the Peroxide of Iron, Alumina, and Phosphoric Acid, from Manganese, Lime, and Magnesia. 1st Method: By Ammonia. 2d. By Alkaline Acetates. 3d. By Alkaline Succinates. 4th. By Carbonate of Barium. Treatment of the Precipitate composed of the Peroxide of Iron, Alumina, and Phos-

phoric Acid. Treatment of the liquid containing Manganese, Lime, and Magnesia. 1st Method: By Hydrosulphide of Ammonium. 2d. By Chlorine Gas. 3d. By Bromine, Observations. III. Determination of Loss. IV. Determination of Water by Calcination, Determination of Hygroscopic Water; Determination of Water in Combination. V. Determination of Carbonic Anhydride. VI. Determination of Protoxide of Iron. VII. Determination of Phosphoric Acid. Observations. 1st Method: By Sulphite of Sodium. 2d. By Fusion with Alkaline Carbonates. 3d. By Tin. 4th. By Molybdate of Ammonium. Observations. VIII. Determination of Sulphur. 1st Method: By Fuming Nitric Acid. 2d By Fusion with the Alkaline Carbonates and Saltpetre. Observations. IX. Determination of the Oxide of Zinc. 1st Method: By Hydrosulphuric Acid. 2d. By Hydrosulphide of Ammonium in an Ammoniacal solution. X. Determination of Lead. 1st Method: By Hydrosulphuric Acid. 2d. By Sulphuric Acid. XI. Determination of Arsenic Acid—Assay of Slags Scoriæ, Fluxes, and Clays.

PART V. ASSAY OF IRON ORES BY THE DRY METHOD.

PART VI. ANALYSIS OF CAST IRON, MALLEABLE IRON, AND STEEL. CHAP. I. Determination of Iron. II. Determination of Manganese. III. Determination of Silicon. IV. Determination of Phosphorus. V. Determination of Sulphur. 1st Method: By Direct Transformation of Sulphur into Sulphuric Acid. 2d. By Previous Transformation of Sulphur into Hydrosulphuric Acid. 1°. Employment of Alkaline Solution of Oxide of Lead. 2°. Employment of Nitrate of Silver. VI. Determination of Carbon. A.—Determination of total amount of Carbon. 1°. Determination of Carbon by Combustion. 2°. Determination of Carbon after Elimination from Iron. (*a.*) Previous Elimination of Carbon. 1st Method: By Bromine. 2d. By Chloride of Copper. 3d. By Bichloride of Mercury. 4th. By Galvanic Current. (*b.*) Determination of Weight of Carbon after Elimination. 1st Method, 2d, 3d. By Combustion. B.—Determination of Graphite or Suspended Carbon. C.—Determination of Carbon of Combination. 1st Method: By Difference. 2d. By Colorimetric Process. General Analysis of Cast Iron.

PART VII. ASSAY OF FUELS. CHAP. I. Determination of Water. II. Determination of Ashes. III. Determination of Sulphur. IV. Determination of Calorific Power. V. Testing Coal, with reference to the Manufacture of Coke.

Dyer and Color-maker's Companion:

Containing upwards of two hundred Receipts for making Colors, on the most approved principles, for all the various styles and fabrics now in existence; with the Scouring Process, and plain Directions for Preparing, Washing-off, and Finishing the Goods. In one vol. 12mo. . $1 25

Easton.—A Practical Treatise on Street or Horse-power Railways:

By ALEXANDER EASTON, C.E. Illustrated by 23 plates. 8vo., cloth, $2 00

Elder.—Questions of the Day:

Economic and Social. By Dr. WILLIAM ELDER. 8vo. . . $3 00

Fairbairn.—The Principles of Mechanism and Machinery of Transmission:

Comprising the Principles of Mechanism, Wheels, and Pulleys, Strength and Proportions of Shafts, Coupling of Shafts, and Engaging and Disengaging Gear. By WILLIAM FAIRBAIRN, Esq., C.E., LL.D., F.R.S., F.G.S., Corresponding Member of the National Institute of France, and of the Royal Academy of Turin; Chevalier of the Legion of Honor, etc. etc. Beautifully Illustrated by over 150 wood-cuts. In one volume 12mo. $2 50

CONTENTS.—CHAP. I.—THE PRINCIPLES OF MECHANISM.—GENERAL VIEWS, LINKWORK, WRAPPING CONNECTORS, WHEEL WORK, SLIDING CONTACT:—General Views

Relating to Machines; the Parts of a Machine; Elementary Forms of Mechanism; Link-work.

Elementary Forms of Mechanism:—To Construct Watt's Parallel Motion. to Multiply Oscillations by means of Link-work; to Produce a Velocity which shall be Rapidly Retarded by means of Link-work; to Produce a Reciprocating Intermittent Motion by means of Link-work; the Rachet Wheel and Detent; Intermittent Motion Produced by Link-work connected with a Ratchet Wheel; Wrapping Connectors; Speed Pulleys; Guide Pulleys; to Prevent Wrapping Connectors from Slipping; System of Pulleys; to Produce a Varying Velocity Ratio by means of Wrapping Connectors; Wheel Work Producing Motion by Rolling Contact; Idle Wheels; Annular Wheels—Concentric Wheels; Wheel Work when the Axes are not Parallel to each other; Face Wheel and Lantern—Crown Wheels; to Construct Bevel Wheels or Bevel Gear when the Axes are in the same Plane; to Construct Bevel Gear when the Axes are not in the same Plane; Variable Motions Produced by Wheel Work having Rolling Contact; Intermittent and Reciprocating Motions Produced by Wheel Work having Rolling Contact; the Wedge and Movable Inclined Plane; Sliding Pieces Producing Motion by Sliding Contact; the Eccentric Wheel, Cams, Wipers, and Tappets; to find the Curve for Forming the Groove of a Cam, so that the Velocity Ratio of the Rod and Axes of the Cam may be Constant; the Swash Plate; Construction of Screws; the Solid Screw and Nut; the Common Press; the Compound Screw; the Endless Screw; the Differential Screw; the Archimedean Screw Creeper; Mechanism for Cutting Screws; to Produce a Changing Reciprocating Rectilinear Motion by a Combination of the Cam and Screw; to Produce a Boring Motion by a Combination of the Screw and Tootbed Wheels.

Chap. II.—On Machinery of Transmission.—On Wheels and Pulleys.—Wrapping Connectors; where Employed; Advantages and Disadvantages of; Material Employed in the Construction of; Strength of; Table of Approximate Widtbs of Leather Straps, in Inches, Necessary to Transmit any Required Number of Horse-power.

Toothed Wheels.—Introduction of; Construction of Mortise Wheels; Smeaton's Introduction of Cast Iron as a Material for Spur Wbeels; Rennie's Use of Cast Iron in all the Details of Mill-work, as Exemplified in the Construction of the Albion Mills; True Principle of Construction; Tootb-cutting Machine.

Spur Gearing.—Definitions.

Pitch of Wheels.—Rules for Finding the Pitch and Diameter of Wheels; Table of Constants for Wheel Work; Rules for Finding the Pitch, Diameter, and Number of Teeth; Prof. Willis's Method of Graduating the Sizes of Wheels; Table Showing the Relation of Pitch, Diameter, and Number of Teeth.

Teeth of Wheels.—The Principles which Determine the Proper Form; Formation of Epicycloidal and Hypocycloidal Curves; Construction of Epicycloidal Teeth; Construction of Involute Teeth; Prof. Willis's Method of Striking the Teeth of Wheels; Odontograph; General Form and Proportions of Teeth of Wheels; Table of Proportions of Teeth of Wheels for Average Practice; Table giving the Proportions of the Teetb of Wheels in inches and thirty-seconds of an inch.

Bevel Wheels.—Examination of the Curves; Formation and Form of Teeth.

Skew Bevels.—Definitions and Method of Setting Out the Teeth.

The Worm and Wheel.—Description of Construction.

Strength of the Teeth in Wheels.—Rules to be Observed in Calculations; Line of Greatest Strain; Table of Thickness, Breadth, and Pitch of Teeth, of Wheels; Table of Relation of Horse-power Transmitted, and Velocity at the Pitch Circle to Pressure on Teeth; Table showing the Pitch and Thickness of Teetb to Transmit a Given Number of Horses-power at Different Velocities; Table showing the Breadth of Teeth Required to Transmit Different Amounts of Force at a Uniform Pressure of 400 lbs. per inch.

Chap. III.—On the Strength and Proportions of Shafts:—The Factory System Necessitates the Use of Long Ranges of Shafts.

Division I. The Material of which Shafting is Constructed.

Division II. Transverse Strain:—Resistance to Rupture; Rules for the Strength of Shafts; Table of Resistance to Flexure; Weights Producing a Deflection of 1-1200 of the Length in Cast Iron Cylindrical Shafts; Table of Resistance to Flexure; Weights Producing a Deflection of 1-1200 of the Length in Wrought Iron Cylindrical Shafts; Table of Deflection of Cast Iron Cylindrical Shafts Arising from the Weight of the Shaft; Table of Deflection of Wrought Iron Cylindrical Shafts Arising from the Weight of the Shaft.

Division III. Torsion:—Coulomb's Deductions and Formula; Bevan's Values of Modulus of Torsion; Wertheim's Formulæ for Cylindrical Bodies; Résumé of Experiments on Cylinders of Circular Section; Résumé of Experiments on the Torsion of Hollow Cylinders of Copper; Résumé of Experiments on the Torsion of Elliptical Bars;

Table of the Safe Working Torsion for Cast Iron Shafts; Table of the Safe Working Torsion for Wrought Iron Shafts.

DIVISION IV. Velocity of Shafts; Table of the Diameter of Wrought Iron Shafting Necessary to Transmit with Safety Various Amounts of Force.

DIVISION V. ON JOURNALS:—Length of Journals; Ultimate Pressure per Square Inch on Journal; Form of Journals.

DIVISION VI. FRICTION:—Laws of; Rennie's Table of Coefficients of Friction under Pressures Increased Continually up to Limits of Abrasion.

DIVISION VII. LUBRICATION:—Lubricants; Method of Effecting Complete Lubrication.

CHAP. IV.—ON COUPLINGS FOR SHAFTS AND ENGAGING AND DISENGAGING GEAR.—COUPLINGS:—Primitive Cast Iron Square Coupling Box; the Claw Coupling; Mr. Hewe's Coupling; the Disk Coupling; the Circular Half-lap Coupling; Rules for the Proportions of the Half-lap Coupling; the Cylindrical Butt-end Coupling.

DIVISION VIII. DISENGAGING AND RE-ENGAGING GEAR:—Throwing Wheels out of Gear with an Horizontal Lever; Throwing Wheels out of Gear with a Standard or Plummer-block and Movable Slide; Disengaging Machinery by the Fast and Loose Pulley; Disengaging Machinery with the Sack Teagle Motion; Callendering Marine Friction Clutch; Friction Cones; Friction Disks; Friction Couplings; Disengaging and Re-engaging Clutch; two other forms of ditto; Mr. Bodmer's Clutch.

DIVISION IX. HANGERS, PLUMMER-BLOCKS, ETC., FOR CARRYING SHAFTING:—Pedestal for Supporting Shafting on the Floor; Pedestal for Bolting Shafting to a Wall; Hanger for Suspending Shafting from a Beam in the Ceiling; Hanger for Suspending Shafting from the Floor; Hanger where Great Strength is Required; Hanger to Connect Two or Three Ranges of Shafting; Method of Connecting Ranges of Shafting at Right Angles to each other by Means of Plummer-blocks; Table of the Diameters, Pitch, Velocity, etc., of Spur Fly Wheels of the New Construction.

MAIN SHAFTS:—Material, Diameter, etc.; Description of the Main Vertical Shafts; Description of the Method of Gearing the Saltaire Mills; Method Adopted to Lessen the Friction on the Foot of the Vertical Shaft; Present Method of Bevel Wheels; Transmission of Power to Machinery at Obtuse Angles by the Universal Joint; Table of the Length, Diameter, etc., of Couplings, Coupling Boxes, etc.

* * * The great principles given in this work lie at the very foundation of the art of transmitting mechanical power, and must prove of inestimable value to American mill owners, mechanics, and operatives. Mr. FAIRBAIRN gives the results of his very successful practice as a millwright and engineer during a period of half a century—a period which has contributed more than any previous one to the manufacturing industry of the world. And, as there is probably no department of practical science so generally useful, or perhaps so little studied, as the Machinery of Transmission, the publisher has much pleasure in placing within reach of the intelligent class for which it is intended, in a compact and comparatively cheap form, the author's rich and valuable experience on this important subject.

Forsyth.—Book of Designs for Headstones, Mural, and other Monuments:

Containing 78 Designs. By JAMES FORSYTH. With an Introduction by CHARLES BOUTELL, M. A. 4to., cloth $5 00

CONTENTS.—PLATE 1. Five Designs for Churchyard or Cemetery Headstones. 2. Two Designs for Headstones: one Headstone with a low Coffin-shaped Tomb; and one Cross rising from a Recumbent Slab. 3. Five Designs for Headstones and Memorial Crosses. 4. Four Designs for Headstones, two of them with low Coffin-shaped Tombs, and one for a canopied Monument, containing Bas-relief on one side, and Bust in alto-relief on the other. 5. Three Designs for Crosses, and two for Headstones, one of them with a low Tomb. 6. Four Designs for Headstones, one of them with an Inclosure. 7. A Design for a Canopied Monument. 8. Designs for two Tombs, one of them flat, with an Incised Slab, and the other with Cross on a Slab, supported by four Angels. 9. Three Designs for Coped Tombs, one of them Crueiform. 10. Designs for two Coped Tombs, and for three Headstones. 11. A Design for a Double Headstone, surmounted by a Cross, and with an Inclosure of Metal-work. 12. Designs for two Mural Monuments. 13. Three Designs for Mural Monuments, the central one to contain a Medallion Portrait of the Deceased, and one intended to commemorate a Seafaring person. 14. Designs for two Mural Monuments, one of them after the manner of a Triptych. 15. Designs for four Mural Monuments. 16. Designs for six Mural Monuments, two of

them Military. 17. Designs for two Mural Monuments, one with Portrait in alto-relief and Angels, and the other with Angels in bas-relief. 18. Designs for three Mural Monuments, with sculptured Angels in alto-relief. 19. Designs for five Mural Monuments, two being Military, one having Portrait in bas-relief. 20. Designs for two Mural Monuments, containing Bas-reliefs. 21. Designs for two Coped Tombs, with iron Crosses, one having iron Cresting. 22. Two Designs for Commemorative Crosses. 23. A Design for a raised Tomb, with a Recumbent Effigy, Angels, and Bas-reliefs. 24. Two Designs for Altar Monuments, one with Portrait in alto-relief. 25. Designs for two Monuments, with Recumbent Figures, No. 77 having been executed by the Author to the memory of a Lady who, with her new-born infant, died on Easter-day; the other having been also executed by the Author to the memory of the late Earl of Cawdor. A Model of this latter Monument was exhibited, with other Works of Monumental and Ecclesiastical Sculpture, at the International Exhibition of 1862, for which the Author obtained the unusual award of Two Prize Medals.

Gilbart.—History and Principles of Banking:

A Practical Treatise. By JAMES W. GILBART, Manager of the London and Westminster Bank. With Additions. One volume, octavo, 600 pages, sheep $5 00

Gothic Album for Cabinet Makers:

Comprising a Collection of Designs for Gothic Furniture. Illustrated by twenty-three large and beautifully engraved plates. Oblong. . $3 00

The Plates in this volume Comprise Designs for Sofas, Arm, and other Chairs, Stools, Taborets, Pries-Dieu, Tables, Chests of Drawers, Wardrobes, Chimney Pieces, Sideboards, Pier Tables, Etagères, Desks, Book-cases, etc. etc.

Gregory.—Mathematics for Practical Men:

Adapted to the Pursuits of Surveyors, Architects, Mechanics, and Civil Engineers. BY OLINTHUS GREGORY. 8vo., plates, cloth . . $3 00

Griswold.—Railroad Engineer's Pocket Companion for the Field:

Comprising Rules for Calculating Deflection Distances and Angles, Tangential Distances and Angles, and all Necessary Tables for Engineers; also the art of Levelling from Preliminary Survey to the Construction of Railroads, intended Expressly for the Young Engineer, together with Numerous Valuable Rules and Examples. By W. GRISWOLD. 12mo., tucks. $1 75

Guettier.—Metallic Alloys:

Being a Practical Guide to their Chemical and Physical Properties, their Preparation, Composition, and Uses. Translated from the French of A. GUETTIER, Engineer and Director of Founderies, author of "La Fouderie en France," etc. etc. By A. A. FESQUET, Chemist and Engineer. In one volume, 12mo. $3 00

CONTENTS.—INTRODUCTION. PART I.—CHAP. I. GENERAL REMARKS ON THE METALS COMMONLY USED IN ALLOYS.—Brass; Tin; Zinc; Lead; Iron; Bismuth; Antimony; Nickel; Arsenic; Mercury; Gold; Silver; Platinum; Aluminium; Tables. II. PHYSICAL AND CHEMICAL PROPERTIES OF ALLOYS.—Fusibility; Durability; Ductility; Tenacity; Density; Elasticity; Specific Heat; Latent Heat; Oxydation. III. PREPARATION AND COMPOSITION OF ALLOYS.—Mixture; Parting; Cooling; Crystallization; Eliquation; Temperature; Alloys at Different Degrees; Fusion; Questions in Fabrication; Precautions to be Taken; Different Practical Elements; Waste; Determination of the Elements of an Alloy.

PART II.—CHAP. I. ALLOYS OF THE INDUSTRIAL METALS OF THE FIRST ORDER.—Outline; Studies on Alloys of Copper, of Zinc, of Tin, and of Lead; Alloys of Iron with Copper, Zinc, Tin, and Lead. II. ALLOYS OF THE INDUSTRIAL METALS OF THE SECOND ORDER.—Alloys of Bismuth; of Antimony; of Nickel; of Arsenic; Amalgams of Mercury, with the Metals of the First and Second Class. III. ALLOYS OF THE PRECIOUS METALS APPERTAINING TO THE ARTS, OR MORE PARTICULARLY TO INDUSTRIES OF LUXURY.—Alloys of Gold; of Silver; of Platinum; Different Alloys of Aluminium. IV. ALLOYS OF METALS EITHER LESS OR NOT AT ALL USED IN INDUSTRY.—Outline; Manganese; Chrome; Cobalt; Cadmium; Titanium; Uranium; Tungsten; Molybdenum; Osmium; Iridium; Palladium; Rhodium; Ruthenium; Tellurium; Potassium; Sodium, etc.

PART III.—ALLOYS UTILIZED IN INDUSTRY.—Bronzes of Art; Alloys of Coin; of Cannon, Fire-arms, and Projectiles; Alloys Capable of Being Laminated and Drawn Out; Sheathing Metal; Alloys for Printing Type; Engravers Plates, etc.; of Bells; Musical Instruments, etc.; Philosophical and Optical Instruments, for Bijouterie, Jewelry, Britannia Ware, etc.; White Alloys; Fusible Alloys; Alloys for the Construction of Machines, Friction Pieces, etc.; Solders; Miscellaneous Alloys.

Gesner.—A Practical Treatise on Coal, Petroleum, and other Distilled Oils.

By ABRAHAM GESNER, M. D., F. G. S. Second edition, revised and enlarged. By GEORGE WELTDEN GESNER, Consulting Chemist and Engineer. Illustrated. 8vo. $5 00

Gibson.—The American Dyer:

A Practical Treatise on the Coloring of Wool, Cotton, Yarn, and Cloth, in three parts. Part First gives a descriptive account of the Dye Stuffs; if of vegetable origin, where produced, how cultivated, and how prepared for use; if chemical, their composition, specific gravities, and general adaptability, how adulterated, and how to detect the adulterations, etc. Part Second is devoted to the Coloring of Wool, giving recipes for one hundred and twenty-nine different colors or shades, and is supplied with sixty colored samples of Wool. Part Third is devoted to the Coloring of Raw Cotton or Cotton Waste, for mixing with Wool Colors in the manufacture of all kinds of Fabrics, gives recipes for thirty-eight different colors or shades, and is supplied with twenty-four colored samples of Cotton Waste. Also, recipes for Coloring Beavers, Doeskins, and Flannels, with remarks upon Anilines, giving recipes for fifteen different colors or shades, and nine samples of Aniline Colors that will stand both the Fulling and Scouring process. Also, recipes for Aniline Colors on Cotton Thread, and recipes for Common Colors on Cotton Yarns. Embracing in all over two hundred receipes for Colors and Shades, and ninety-four samples of Colored Wool and Cotton Waste, etc. By RICHARD H. GIBSON, Practical Dyer and Chemist. 1 vol. 8vo. $12 50

Gruner.—Studies of Blast Furnace Phenomena.

By M. L. GRUNER, President of the General Council of Mines of France, and lately Professor of Metallurgy at the Ecole des Mines. Translated, with the author's sanction, with an Appendix, by L. D. B. GORDON, F.R.S.E., F.G.S. In one vol. 8vo. $2 50

Hats and Felting:

A Practical Treatise on their Manufacture. By a Practical Hatter. Illustrated by Drawings of Machinery, etc. 8vo. . . . $1 25

Harris.— Gas Superintendent's Pocket Companion.

By HARRIS & BROTHER, Gas Meter Manufacturers, 1115 and 1117 Cherry Street, Philadelphia. Full bound in pocket-book form . . $2 00

Hofmann.—A Practical Treatise on the Manufacture of Paper in all its Branches.

BY CARL HOFMANN. Late Superintendent of paper mills in Germany and the United States; recently manager of the Public Ledger Paper Mills, near Elkton, Md. Illustrated by one hundred and ten wood-engravings, and five large Folding Plates. In one volume 4to,, cloth; about 400 pages. $15 00

The machinery represented is in active operation, and has been built by first-class engineers. The illustrations are made to a scale and can be used in the machine shop for working-drawings. The latest and most successful methods of making paper and boards from rags, straw, wood, waste paper, and other substitutes, have been practised and investigated by the author and are fully discussed. The directions for boiling, bleaching, sizing, and coloring are given in such a practical and detailed manner, that any intelligent man can make use of them.

Information has been collected regardless of time and expense in the expectation that the trade will appreciate it. Nearly every papermaker has paid for receipts or advice—the value of which was at least doubtful—more than the price of this book, while in it he will find the best of them and very much more. The contents will be found to cover the entire subject with much completeness, and the details to be given with exactness.

CONTENTS.—CHAPTER I.—Paper. II.—Manufacture by Hand. III.—Manufacture of Paper from Rags by Machinery. *Section* 1. Sorting, Cutting, and Dusting.—2. Boiling.—3. Washing, Bleaching, Draining, Bleaching with Gas.—4. Mixing, Washing and Beating, Sizing, Coloring, Patent Engines, Stuff-chests, and Stuff-pumps.—5. Making Paper on the Machine. *a*. Fourdrinier Paper Machine; *b*. Cylinder Paper Machine; *c*. Harper's Improved Paper Machine.—6. Surface Sizing.—7. Finishing.—IV. Substitutes for Rags.—1. Historical Sketch.—2. Fibres or Cellulose.—3. Waste Paper. 4.—Straw and Esparto.—5. Wood.—6. Mechanically Prepared Wood-Pulp —7. Cane Fibres.—V. Description of the Manufacture of some classes of Paper and Boards.—1. Bank-note Paper.—2. Tissue Paper.—3. Collar Paper.—4. Manilla Paper.—5. Tobacco Paper.—6. Paper from Cotton Waste.—7. Boards.—8. Roofing Paper.—9. Parchment Paper.—VI. General Remarks upon the Location, Construction, and Management

of Paper Mills.—1. Wash Water.—2. Water-power.—3. Steam Boilers.—4. Steam Engines.—5. Pipes.—6. Pulleys, Belts, Gearings.—7. Transportation in the Mill.—8. Heating the Mill.—9. Lighting.—10. Machinery.—11. Buildings.—12. Location and Site.—13. Capital.—14. Labor and Management.—15. Statistics. Index. Advertisements.

Hughes.—American Miller and Millwright's Assistant.

By Wm. Carter Hughes. A new edition. In one volume, 12mo. $1 50

Among the Contents will be found the following:—Introduction—Explanation of Technical Words. Part I.—On the First Principles of Mechanics—The Principle of the Lever—Inclined Plane—Pulley—Motion—Central Forces—Friction, or Resistance to Motion—Table of the Surfaces of Contact without Unguents—Table of the Results of Experiments on Friction, with Unguents, by M. Morin—Table of Diameters of First Movers—Table of Diameters and Circumferences of Circles, Areas, and Side of Equal Squares—Geometrical Definitions of the Circle and its Parts—Centre of Percussion and Oscillation—Hydrostatics: Introduction—On the Upward and Downward Pressure of Water—Specific Gravity—Table of Specific Gravities—Hydrodynamic Power of Water-wheels—On the Action and Reaction of Water, as applied to Water-wheels—On the Construction of the Combination Reaction Water-wheel—Table of Velocities of Water-wheels per Minute, with Heads of from 4 to 30 feet—Table of the Number of Inches of Water Necessary to Drive One Run of Stone, for Grist or Saw-mills on Heads of 4 to 30 feet—Table showing the Required Length of Overshot and Breast-wheels, on heads of 10 to 30 feet—Howd's Direct Action Water-wheel—Directions for Making the same—Jagger's Patent Turbine Water-wheel—Water Table for Jagger's Patent Turbine Water-wheel—Table showing the Revolutions per Minute of Jagger's Turbine—Table showing the Velocity of Water. Part II.—Remarks on the Culture of Grain, etc.—Table of Grain grown in the United States—On the Quality of French Burr, as Best Adapted for Grinding Wheat and Corn—The Raccoon Burr Stone—Tram Staffs—Directions for Preparing New Stones for Grinding—Directions for Laying Out the Dress in Millstones—A Special Treatise on the Different Millstone Dresses now in Use, with Practical Remarks on their Action—Directions for Making Furrows on the Most Approved Plan—Directions for Staffing and Cracking the Face of the Millstone—On the Best Size of Millstones for Different Water-powers—Practical Remarks on Grinding Wheat and Corn—Remarks on Indian Corn, as an Article of Foreign Consumption—On the Construction of Merchant Bolts on the Old Plan—Description of a New Arrangement of the Merchant Bolts on the Most Approved Plan—Directions for Making Bolting Cloths of all Descriptions—Size of Mill Picks for Dressing Stones—Composition for Tempering Cast Steel Mill Picks—On the Use of the Proof Staff—On the Amount of Help Necessary to be Employed in a Mill of Four Run of Stones, with their Duties Respectively—Hydraulics, as Pertaining to the Practical Millwright—Powers of Gravity, Percussion, or Impulse, with the Reaction Attachment—Remarks to the Millwright on the Necessity of Economy in Planning and Arranging the Machinery of Flouring and Grist Mills—On Bedding the Stone—To Find the Number of Revolutions of the Water-wheel per Minute—To Find the Velocity of the Stone per Minute—Rule to Find the Diameters of all Pitch Circles—To Find how many Revolutions the Stone makes for one of the Water-wheel—On Machinery—Rule for Constructing the Conveyor—On the Construction of the Mill-dam—On the Different kinds of Smut Machines now in Use, with Rules for Making the same—Remarks on a Late Invention for Introducing Air between Mill-stones when Grinding—Description of the Author's Grain Dryer—Rules for the Purchase of Wheat for Millers' Use—The Proper Method for Fitting the Bale and Driver to the Mill-stone—Remarks on Packing Flour—Table for Packing Flour—Remarks on Branding Flour in Barrels—Mauk's Patent Bolt—On the Inspection of Flour—Report on the Breadstuffs of the United States, their Relative Value, and the Injury which they Sustain by Transportation, Warehousing, etc. etc., by Lewis C. Beck, M. D.—Analysis of Wheat Flour—Result of the Analysis—Table for Reckoning the Price of Wheat—Steam as Applied to Propelling Mills—On the Construction of the Saw-mill—Table for Measuring Saw-logs.

Hurst.—A Hand-Book for Architectural Surveyors and others engaged in Building:

Containing Formulæ useful in Designing Builder's work, Table of Weights, of the materials used in Building, Memoranda connected with Builders' work, Mensuration, the Practice of Builders' Measurement, Contracts of Labor, Valuation of Property, Summary of the Practice in Dilapidation, etc. etc. By J. F. HURST, C. E. 2d edition, pocket-book form, full bound. $2 50

Jervis.—Railway Property:

A Treatise on the Construction and Management of Railways; designed to afford useful knowledge, in the popular style to the holders of this class of property; as well as Railway Managers, Officers, and Agents. By JOHN B. JERVIS, late Chief Engineer of the Hudson River Railroad, Croton Aqueduct, etc. One volume, 12mo. cloth. . . . $2 00

CONTENTS.—Preface—Introduction. *Construction.*—Introductory: Land and Land Damages; Location of Line; Method of Business; Grading; Bridges and Culverts; Road Crossings; Ballasting Track; Cross Sleepers; Chairs and Spikes; Rails; Station Buildings; Locomotives, Coaches and Cars. *Operating.*—Introductory: Freight; Passengers; Engine Drivers; Repairs to Track; Repairs of Machinery; Civil Engineer; Superintendent; Supplies of Material; Receipts; Disbursements; Statistics; Running Trains; Competition; Financial Management; General Remarks.

Keene.—A Hand-Book of Practical Gauging,

For the Use of Beginners, to which is added A Chapter on Distillation, describing the process in operation at the Custom House for ascertaining the strength of wines. By JAMES B. KEENE, of H. M. Customs. 8vo. $1 25

Kelley.—Speeches, Addresses, and Letters on Industrial and Financial Questions.

By Hon. WILLIAM D. KELLEY, M.C. One vol., 544 pages, 8vo. $3 00

Kellogg.—A New Monetary System:

The only means of Securing the respective Rights of Labor and Property, and of Protecting the Public from Financial Revulsions. By EDWARD KELLOGG. Revised from his work on "Labor and other Capital." With numerous additions from his manuscript. Edited by MARY KELLOGG PUTNAM. Fifth edition. To which is added a Biographical Sketch of the Author. One vol. 12mo. Paper cover . . . $1 00
Bound in cloth 1 50

CONTENTS.—Biographical Sketch of the Author—Preface by the Author—Introduction. PART I. The Principles of Distribution. Chap. I. Of Value. Chap. II. Money, the Medium of Distribution. Chap. III. The Rates of Interest the Governing Power of Distribution to Labor and Capital. Chap. IV. The Banking System. Chap. V. The Amount of a Currency should be Limited *only* by the Wants of Business. Chap. VI. The Necessity of Credit. Chap. VII. A Well Regulated Currency impossible under Present Laws. PART II. A True Monetary System. Chap. I. The Security of a Paper Currency. Chap. II. The Safety Fund. Chap. III. The Advantages of the Safety Fund Money over Specie. Chap. IV. Objections to the Safety Fund considered. Chap. V. Advantages of the Safety Fund. Conclusion. Appendix. Index.

Kinsley.—Self-Instructor on Lumber Surveying:

For the use of Lumber Manufacturers, Surveyors, and Teachers. By CHARLES KINSLEY, Practical Surveyor and Teacher of Surveying. In one vol. 12mo. $2 00

CONTENTS.—Rule for Measuring Rectangular Boards—Exercise on the Rule—To find the Contents of a Triangular Board—Exercise on the Rule—To find the Solidity of a Sphere or Globe; the Contents of a Triangular Solid; the Superficial Contents of a Globe; the Contents of a Circular Board—Rule for finding the Contents of a Circle—Rule for finding the Diameter or Circumference of a Circle—Table for Measuring 1 inch Boards without a Board Rule, from 2 to 36 inches wide—Exercise on the Table—Table for Measuring 1¼ inch Boards without a Board Rule—Exercise on the Table—Table for 1½ inch Boards without using the Board Rule—Exercise on the Rule—Table for Plank from 2 to 30 inches wide—Exercise on the Table—Table for 3 inch Deals from 3 to 24 inches wide; for 4 inch Deals from 4 to 12 inches wide; for 5 inch Timber from 5 to 12 inches wide; for 6 inch Timber from 6 to 12 inches wide; for 7 inch Timber from 7 to 12 inches wide; for 8 inch Timber from 8 to 12 inches wide; for 9 inch Timber from 9 to 12 inches wide; for 10 inch Timber from 10 to 12 inches wide; for 11 inch Timber from 11 to 12 inches wide; for 12 inch Timber from 12 to 20 inches wide—Plan of Drawing a Plank Shingle, with Directions for Dotting Plank, Deal, etc.—Rule for Plank Specifications—How to keep a Joist or Scantling Shingle—New York Deals, 3 inch—Specification Rule for 3 inch; for 4 inch—5 inch Timber Shingle, with Rule for Specification—Rule for 6 inch Specification; for 7 inch; for 8 inch; for 9 inch; for 10 inch; for 11 inch; for 12 inch—Rule for finding the Contents of Battens or 2½ inch stuff—Specification of Batten Shingle and Rule—Random Shingle, Contents given in Columns—Random Shingle, Running Length in the Columns—Table showing the number of Feet in Length of all Dimensions that will make 1000 feet of Board Measure—Table showing the number of Feet in Length of all Dimensions from 5 x 5 inches to 22 x 24 inches that will make 1000 Cubic Feet, with Rules showing how both tables are computed—New Rules for finding the Contents in Cubic Feet of Timber from 5 x 5 up—Second Method of making out Specification, and Rule—Specification of Philadelphia Deal, and Rule—How to use the Board Rule, with Exercise—Rule for Measuring Logs, with Example—To find the largest Square piece of Timber that can be sawed from a Round Log by having the circumference or diameter given—Form of Bills of Lading—Surveyor's Bills and Receipts—New Rules for finding the Spherical Contents of Plank, Deal, Joist, Battens, and Timber—Given the Dimensions of the End of a Plank, to find what Length of it will make a Foot—To find the Solid Contents of a piece of Tapering Timber—When a Board or Plank is wider at one end than the other, to find what length of it will make a Foot, or any desired quantity—To find how much in Length will make a Solid Foot, or any other desired quantity of Squared Timber of Equal Dimensions from end to end—Table for Measuring Round Timber by the Quarter-girt Areas—Table and Rule for finding the Weight of Timber from a Survey of its Contents—English Government Rule for finding the Tonnage of Vessels—United States Government Rule for finding the Tonnage of Vessels—Gauging of Casks—Ullaging of Casks—Questions for Exercise—Log Rule for Round Timber—Directions for using the Log Rule—Interest Table and Rule—Lumber Surveyor's Scale—Wages Calculator by the Month—How to Average Timber and Measure Hay—Stonemason's Work for Builders, Contractors, etc.—Day Wages Calculator—Weekly Wages Calculator—Tonnage, continued.

Kentish.—A Treatise on a Box of Instruments,

And the Slide Rule; with the Theory of Trigonometry and Logarithms, including Practical Geometry, Surveying, Measuring of Timber, Cask and Malt Gauging, Heights, and Distances. By THOMAS KENTISH. In one volume. 12mo. $1 25

Kobell.—Erni.—Mineralogy Simplified:

A short method of Determining and Classifying Minerals, by means of simple Chemical Experiments in the Wet Way. Translated from the last German Edition of F. VON KOBELL, with an Introduction to Blow-pipe Analysis and other additions. By HENRI ERNI, M. D., Chief Chemist, Department of Agriculture, author of "Coal Oil and Petroleum." In one volume, 12mo. $2 50

CONTENTS.—The Blow-pipe; Blowing with the Blow-pipe; Apparatus Requisite for Ordinary Blow-pipe Analysis; Blow-pipe Reagents Proper; Table of Reactions of Minerals; Cupellation; Table of Simple or Elementary Bodies. INTRODUCTION TO MINERALOGY. SYNOPSIS.—I. MINERALS WITH METALLIC LUSTRE.—A Fusibility from 1–5, or easily Volatilized; B. Infusible or Fusibility above 5, and do not Volatilize. II. MINERALS WHICH DO NOT SHOW METALLIC LUSTRE.—A. B. B. Volatilize easily or Burn; B. Fuse between 1 and 5, and Volatilize only Partially, or not at all. II. B. B. Alone or Fused with Soda Ore Coal yield no Metallic Globule, and the Mass Remaining does not Act on the Magnetic Needle; C. Infusible or Fusibility above 5. I. Table Showing the Deportment of Inorganic Bodies and their Compounds in Preliminary Examinations before the Blow-pipe. II. Table Showing the Deportment of Metallic Oxides with Microcosmic Salt (salt of phosphorus) and Borax before the Blow-pipe. III. Table Exhibiting the Solubility of the more Important Metals in Different Mineral Acids.

APPENDIX.—Coal and Asphaltum.

* * * This volume is the best one on Mineralogy for popular use ever published in the English language, and is invaluable to all Mineralogists, Geologists, Assayers, Chemists, Miners of Ores, and all others who have occasion to examine Minerals and Mineral Lands.

Loth.—The Practical Stair Builder:

A Complete Treatise on the Art of Building Stairs and Hand-Rails, Designed for Carpenters, Builders, and Stair-Builders. Illustrated with Thirty Original Plates. By C. EDWARD LOTH, Professional Stair-Builder. One large 4to. volume $10 00

A thorough understanding of the planning and construction of both the Stairs and the Rails, is obviously necessary to a successful Stair-Builder, and it has been my aim, in preparing this book, to cover the whole ground. In this country, where skilled labor is valuable, especially at the present time of our progressive age, any mechanic, particularly any one connected with Building, is expected to do a neat and substantial piece of work in the shortest time and with the use of the least material possible; to accomplish this, he, particularly the Stair-Builder, must be a good linear draughtsman. Linear Drawing is mostly a practical application of the principles and facts arrived at by the demonstrations in Elementary, Constructive, and Descriptive Geometry; the necessary Definitions, Theorems, and Problems of that science are introduced in the forward part of the book in a practical, comprehensive manner, and illustrated on Plates I. to IX.

Plates X. to XXIX. illustrate every conceivable case and form of Stairs and Rails which may come under the stair-builder's notice.

The frontispiece is a perspective view of the staircase Fig. 1, Pl. XXIX., finished in Gothic style, with wainscoting along the wallstring.

By the system followed in this book, the wreath-pieces are all sawed square through the plank, all joints made at once, and the Rail, as also the Stairs, may each be put together and finished in the shop for an entire story, before being taken to the building.

In no case need the thickness of the plank be more than the width of the rail; the instructions given to ascertain the length of odd balusters will be found of service.

The explanation of the Plates is explicit in every particular. That of the practical part of Plates X. to XXIX. is written in such a manner that a very careful study of the theoretical part is *not absolutely necessary*.—From the AUTHOR'S INTRODUCTION.

Landrin.—A Treatise on Steel:

Comprising its Theory, Metallurgy, Properties, Practical Working, and Use. By M. H. C. LANDRIN, Jr., Civil Engineer. Translated from the French, with Notes, by A. A. FESQUET, Chemist and Engineer. With an Appendix on the Bessemer and the Martin Processes for Manufacturing Steel, from the Report of Abram S. Hewitt, United States Commissioner to the Universal Exposition, Paris, 1867. In one volume, 12mo. $3 00

CONTENTS.—HISTORY OF STEEL.—Discovery of Steel—First Furnaces of the Hebrews—the Chinese—the Greeks, Homer—Scarcity of Steel—Bronze—Æthalia—the Chalybes—Furnaces—Fuel in use—Knowledge of Pit Coal—Knowledge of Pig Iron—Iron and Steel in Egypt and Arabia—First Iron Bedstead—Corporation of Blacksmiths—Ores known at that time—Progress of Iron and Steel—Invention of the Hammer and Anvil—Invention of the Bellows—Manufactures in Palestine—Greek Colonies—Discovery of Metals—Iron Coins—The Phœnicians—Metallurgy in Æthalia—First Alloy of Iron and Bronze—Roman Metallurgists—the Moors of Spain—Ancient Bibilis—Germany—Ores employed then—Use of Fluxes—Blowing Machines—Pig Iron unknown to Agricola—Determination of the time of its use—First Blast Furnace—Blast Furnaces in France—Fluss ofen in India—Cast Iron employed in England—Eastern Countries the Birthplace of Steel—First Cementation of Iron—Sheffield Cutlery—Introduction of Cast Steel in England—Puddled Steel invented in Carinthia—Progress of Steel Works in France.

PRELIMINARY OBSERVATIONS.—HEAT: Expansion — Fusion — Colorations by Heat—Unit of Heat. OXYGEN: its affinity for Iron—Metallic Sponge (Chenot's)—Protoxide of Iron (Ferrous Oxide)—Peroxide of Iron (Ferric Oxide)—Affinity for Carbon—Reactions of Carbon and Oxygen—Working of the Blast Furnace—Oxidation of Steel. SULPHUR: its action upon Steel—Process for Removing Sulphur from Ores—How to avoid it in Fuels Action of Rain and Air. PHOSPHORUS: its Action upon Steel—it Combines with Sulphur. WATER: its importance in Metallurgy—its yield in Oxygen—Steam—its action on Sulphur—its action on Silicon—Decrepitation—its Hygrometric state. LIME: its action as an Oxide — its action as a Metal. IRON ORES: importance of their knowledge — their definition—their varieties—How to distinguish them: § 1. Carbonate of Iron—Lithoid Iron—Spathic Iron—Analyses—Superoxidation: § 2. Oligist Iron—its varieties—Analyses—Red Hæmatite—its transformation into Red Chalk—its yield—Presence of Manganese: § 3. Magnetic Iron — Swedish Irons — Analysis of Pig Metal: § 4. Hydrated Oxide of Iron—Brown Hæmatite—Varieties of this Ore. FUELS: Definition—their importance in Metallurgy—Carbon—Varieties of Fuels—Constituent Principles—Carbon and Hydrogen—Ashes of Mineral Fuels—Ashes of Vegetable Fuels: § 1. Wood—Lignine—Calorific Power—Woods divided into two classes—Comparative Value: § 2. Charcoal—Object of Carbonization—Age of the Wood to be felled—Proper time for felling—Methods of Carbonization—Carbonization in heaps—Comparison of the products—Conduct of the operation—Red Charcoal—Rapidity of the Carbonization—Calorific Value of Charcoals—Composition of Charcoal—Density and Weight—Yield in Alkalies: § 3. Pit Coal—Various kinds of Coal—Certain kinds of Coals naturally distilled—Comparative Composition—Calorific Power—Weights—Yield in Sulphur: § 4. Coke—Coals good for Carbonization—Processes of Carbonization—Comparative products in Weights—Comparative products in volumes — Calorific Value — Weights — Object in Carbonizing — Natural Carbonization. § 5. Anthracite—its qualities—its value—its use.

PART FIRST. STEEL AND ITS THEORY.—Definition—Iron—Carbon—Theory of Alloys—Carbides of Iron—Analyses of Steel—Electricity—Solution—Saturation—Definite Proportions—Reactions in the Blast Furnace—Formation of Pig Metal—Unity in Steel—Carbon and Iron—Manganese—Carbides of Manganese—Action of Manganese—Mushet's Steel—Silicon—Alloy made by Berzelius—Composition of Steel—Clouet's Steel—Magnesium—Aluminium—Various Alloys—Chemical Alloys—Experiment—Beginning of Cementation—Steely Iron—Cemented Iron—Blistered Steel—Is this a True Steel?—Fusion

—Remedies—Cast Steel—Steel made in Blast Furnaces—Inferences—Manufactures of Steel in the Alps—Production of Steel in the Pyrenees—Unity in the Theory—Proportion of Carbon. THEORY OF RÉAUMUR: Extracts from Réaumur's work—Case Hardening—Conversion of Iron into Steel—Cementing substances—Nature of these substances—Mode of operation—Trials with Mixtures—Explaining how the Experiments succeeded—Trial with Lime—Trial with Plaster of Paris—Sand—Change of Texture—Trial with Clay—Trial with Leached Ashes—Trial with Glass—the metal cleansed—Necessity of Cementing substances—Uselessness of Secrets—Trial with Fatty matters—Trial with certain Salts—Trial with Soap—Trial with Charcoal—Conclusions—Researches—Alkalies—Borax—Steel not remaining such—Common Salt—Spirits of Salts—Mineral substances—Salts and Charcoal—Best Composition (at Réaumur's epoch)—Charcoals.

QUANTITATIVE ANALYSIS.—Composition of Steel—Combined and Uncombined Carbon—Other Metals Alloyed—Pulverizing—Separation into three portions: 1. Estimation of Carbon—Search for Nitrogen: 2. Estimation of Sulphur and Phosphorus: 3. Estimation of Graphitic Carbon, Silica, Lime, etc.—Search for Chrome and Alumina—Search and estimation of Manganese—Precipitation of the Lime—Search for Magnesium.

PART SECOND.—METALLURGY OF STEEL.—Substances for making Steel.—Classification of the Processes—Division of this Section. NATURAL STEEL: Furnaces—Catalan Forge—Dimensions—Production of Steel or Iron—Position of the Tuyere—Projection of the Tuyere—Slope of the Tuyere—Ores employed—Charging the Furnace—Working—Drawing the Blooms—Length and Waste of the operation. RAW STEEL: Pig Metal employed—Furnaces—Dimensions—Staff of Workmen—Mode of operation—Products and Consumption—Another Method—Westphalian and Silesian Processes—Products and Consumption—Styrian Process. PUDDLED STEEL: Furnace—Pig Metal employed—Working—Products, Consumption, Labor. STEEL OF CEMENTATION: Definition—Cementation at the ordinary temperature—Ignorance on this subject—Cementation in general—Furnace—Dimensions—Charge—Operation—Observations on Furnaces. CAST STEEL: Object of Casting—Crucibles or Pots—Construction of Pots—Choice of the materials—Mixed Clays—Moulds—Drying—Annealing—Various Shapes of Pots—Stands and Lids—Labor—Graphite, its composition—Casting Furnaces—Dimensions—Sheffield Furnaces—Charging—Fuel—Operation—Making the Ingots—Running into large Moulds—Use of Manganese—Remarks on Steel. WOOTZ: Definition—Ore employed—Furnace—Analogy with Natural Steel—Fusion—Waste—Analogy with Cast Steel—Various Processes—Shape of the commercial product. NEW PROCESSES: Summing up of the various processes—Tendency of the Metallurgy of Steel—all processes derived from one principle—Process of Mr. E. Newton—Process of Messrs. Craco Calvert, Fontaine—Process of David Mushet and S. Rodgers—Process of Messrs. Martien and Brooman—Process of Mr. Robert Mushet—Process of Messrs. Price and Nicholson—Process of Mr. Manory—Process of Mr. Sterling—First idea of the Bessemer Process due to Mr. Martien. *Chenot Process:* Principle—a rational idea—Mr. Chenot is struck by it—Disposition of the Apparatus—Enormous Compression—Cementation—New Metallurgy of Steel. *Bessemer Process:* Theory—First idea due to Mr. Martien—Principle of the Operation—Apparatus—Fitting the Converter—Mode of operation. *Taylor Process:* Analogy with the Bessemer Process—Apparatus—Production regulated at will—Continuous Production. *Uchatius Process:* Definition—Pig Iron employed—Granulating the Metal—Theory—Mode of Operation—Proportions—Experiments—Products and Consumption. DAMASCUS STEEL: Damascus Blades—Price and description of Scimetars—Imitations in Europe—How to make the Pattern appear—Theory of Mr. Henri, of Bougeval—Influence of Aluminium. METALLIC TISSUES: Definition—Metallic Alloys—Silver Steel—Mechanical Alloy—Rhodium Steel—Platinum Steel—Metallic Mirrors—Chromium Steel.

PART THIRD.—WORKING OF STEEL.—Division of this Section. REFINING BY DRAWING OR TILTING: The Object of this Operation—Working—Furnace—Influence of a good Workman. WELDING: Temperature—Equilibrium of Heat—Respective Masses of Iron and Steel—Use of Borax. ANNEALING: Annealing is not Tempering—Difference—Degree of Temperature—Cooling in Water—Cooling in Charcoal Dust. HARDENING: Effects from Heat—Slow Cooling—Rapid Cooling—Explanation of the Hardening—Definition—Loss of Specific Gravity—Hardening in Tepid Water—Theorem on Hardening—Limits—Cherry-red Heat—Pure Water—Degrees of Hardening—Temperatures for Hardening—Overheating—Employment of Fusible Alloys—Composition of these Alloys. TEMPERING: Harshness of Steel—Structure of Iron and Steel—Change by Heat—Tilted Steel—Tempering—Effect produced—Changes of Color in Tempering—they act as Guides—Mode of Operation and Precepts. HAMMER HARDENING: Hammering Iron—Hammer Hardening Steel—should not be done too rapidly—Warped or Distorted Pieces—Causes of this phenomenon.

PART FOURTH.—PROPERTIES OF STEEL AND ITS USES.—Contents of this Section. CHARACTERISTICS OF STEEL: Distinction of Acids—Specific Gravity—Granular Texture—Crystalline Texture—Fibrous Texture—Hardness—Differences by Scratching—Substances

for Scratching—Sound of Steel—Fibre of Steel—Welding—Forging—Harshness—Hardness to the File—Differences of Texture—How to make the Trial—Curious phenomenon—What Diodorus and Plutarch relate—Sheffield Cutlers—Mr. Weiss, of London—Tensile Strength—Wheel Tires—Iron Tires—Puddled Steel Tires—Comparative Resistance to Wear—Iron Tires—Puddled Steel Tires—Cast Steel Tires—Runs performed—Horseshoes—English Manufactures—Trade Marks—Swedish Irons—Russian Irons. FILES: Materials for Files—Forging—Hand Forge—Annealing—Truing the Blanks—Grinding—Cutting—Cutting Machines—Hardening—Furnace—Muffles—Why Muffles are employed—Coating—Heating—Colors—Conditions of Success—Number of Men employed to the Furnace—Mode of Immersion—Warping—Straightening—French Files—How to File—Files employed—Color of the File—Trial of Files—Rejected Files—Some Defects in Files—Trial of Bastard Files—Trial of Smooth Files. STEEL WIRE: Drawing Wire—its object—Draw Plates—what made of—the Conditions they have to fulfil—Pointing and Drawing the Wire—Effect of a Coating of Copper—How many Annealings—a Slow Drawing necessary—Oxidation—Annealing Furnace—Furnace of Aigle—Furnace of Mr. Fox—Working of this apparatus—its advantages—Qualities of Steel Wire—Gauges—Principle of Wire Drawing—Pinion and Grooved Wires—Watch Springs—Wires for Musical Instruments. NEEDLES: Choice of the Wire—Length—Pointing—Separation—Head Flattening—Annealing—Making the Groove—Stamping the Heads—Straightening—Inspection—Hardening—Tempering—Polishing—Scouring—Winnowing and Wiping—Loss by the operation—Sorting the Needles—Drilling of the Eyes—Last Polishing and Burnishing—Cemented Needles—Gilt Needles. STEEL PLATE: Choice of the Metal—Processes of Drawing—Steel of Cementation—Slabs—Hammers—Steam Hammers—Rules for Heating—Furnaces—Doubled Slabs—Construction and Material of Rolls—Roughing down Rolls—Train of Rolls—Protection of Slabs—Taking the Oxide off Plates—Hardening—Number of Revolutions of the Rolls—Engraving Plates—Error on this subject. SAWS: Materials—Slabs—Punching the Teeth—Shapes of Teeth—Heating—Hardening—Blazing off—Straightening—Planishing—Hammering and Polishing.

Larkin.—The Practical Brass and Iron Founder's Guide;

A Concise Treatise on Brass Founding, Moulding, the Metals and their Alloys, etc.: to which are added Recent Improvements in the Manufacture of Iron, Steel by the Bessemer Process, etc. etc. By JAMES LARKIN, late Conductor of the Brass Foundry Department in Reany, Neafie & Co.'s Penn Works, Philadelphia. Fifth edition, revised, with Extensive additions. In one volume, 12mo. $2 25

CONTENTS:—On the Properties of Metals. On Metallic Alloys. Table of Metals. Conducting Powers of Metals. Table of Experimental Results as to some of the Chemical and Physical Properties of the Atomic Alloys of Copper and Zinc, and of Copper and Tin. On Founding. On Brass Founding. Copper. On the Reduction of Copper. Tin. On the Reduction of Tin. Grain and Block Tin. On Zinc. On Lead. On Antimony. Order and Working of Metals. On Copper and Tin. Bronze for Cannon, Statues, etc. On Bell Metal. On Copper and Tin Mixtures. Alloys of Copper and Zinc. Alloys of Copper, Zinc, Tin, and Lead. Manheim Gold. Pinchbeck. Princess Metal. Tombac. Artificial Gold. Fine Brazing Solder. Remarks. Facing. Metallic Moulds. Pewtering. Complex Objects. On Bell Founding. On Gun Founding. On Figure Casting. Brass Mirrors. Copper. Metals. Surface of Metals. Blanched Copper. British Weapons and Tools in Bronze, anciently called Corinthian and Syracuse Brass. On Brass. Casting in Plaster. To Transfer Engravings to Plaster Casts. To Varnish Plaster Casts. To Cast Concave or Convex Molds of Metals on Tin Foil, with Plaster. To Cast Vegetables, Insects, Small Birds, Frogs, Fish, etc., in Plaster Moulds. To Prepare a Medal for the above. Sir Isaac Newton's Fusible Metal. Rose's Alloy. Dr. Dalton's Fusible Alloy. To Cast in Wax. To Cast in Sulphur. To Cast in Glue. To make a Fine Glue, wherewith you may cast curious Medals. To Cast in Bread Paste. To cast Figures in Imitation of Ivory. Rice Glue Statuary. A Composition for Ornaments. Alloys, Amalgams, etc. Native Alloys. Density of Metals. Bronze, Bell, and Speculum Metals. Combination and Chemical Action. Yellow Brass. To make Copper Medals and Medallions. Amalgamation of Metals. Bismuth. On Friction. On Bells. On Fluxes. Fusing and Melting Points. Fluidity. Anti-Friction Metals. Table for Converting Decimal Proportions into Division of the Pound Avoirdupois. Keller's Statue Composition. The Chinese Packfong. Copper.

Silver Steel. Copper and Antimony. Antimony and Tin. Copper and Bismuth. Bismuth and Lead. Full Measure of Capacity of Tin and Lead. Brilliants of Fahlum. Queen's Metal. Tin and Zinc. Tin and Iron. To Silver copper. Mosaic gold. To bronze brass, etc. Lacquers. Green Bronze Liquid. To Silver ivory. Zincing. Metal Plates. Cast Metal Bells. Cast Iron Pipes. Cast Metal Cylinders. Specific Gravity and Weights of Materials. Specific Cohesion and Strength of Metals. Direct Cohesion of Metals. Resistance of Metals to Pressure. Resistance of Metals to Torsion. Gold and Silver Solder. Brass Solder. Method of Soldering Gold and Silver. To Cleanse Silver after it is Soldered. Silver Solder for Jewellers. Trinket Composition. Silver Plate and Medal Alloy. Gold Coin of America Alloy. Solder for Iron. Soldering and Burning Metals. Plumber's Solder. Compositions of Pewter. White Metal. Mosaic Mixture. Silvery Looking Metal. Metal for Flute Valve Keys. German Titanium. Spanish Titanium. Britannia Metal. Columbia Metal. Type Metal. German Silver. Speculum Metal. Remarks. Platina. On the Properties of Arsenic. Fontainemoreau's New Alloys of Zinc, a substitute for Bronze, Copper, and Brass. On Zinc as a Protective Covering for Iron; and the Adaptation of the Process of Electro-deposition for that Purpose. Water in Pipes. On Crucibles. Plumbago. Hardening Steel. On Boron. On Sulphur. Selenium. On Chlorine. Metallic Oxides.

APPENDIX:—To Brown Gun Barrels. Varnish for Gun Barrels that have undergone the Process of Browning. Ethereal Solution of Gold. To Coat Small Nails, etc. with Tin. Bronzing Electrotype Casts—Chemical Bronze. Black Lead Bronze. Carbonate of Iron Bronze. To Tin Iron. Liquid Glue. Artificial Fire Clay. A Cement which resists the action of Fire and Water. Cement for the Joints of Cast Iron. Niello-Metallic Ornaments. Tracing Paper. To Fix Drawings. Antidote to Arsenic. To soften Ivory. To separate the Metallic Portion from Gold and Silver Lace. Blueing and Gilding Steel. To Harden Steel Dies. Portable Glue. Prevention of Corrosion. Cement Soluble Glass. Japanning. To Preserve Polished Steel from Rust. Cement for Attaching Metal to Glass. Varnish for Colored Drawings. Japanners' Copal Varnish. Soft Varnish. Hard Varnish. Flexible Varnish. French Polish. Brunswick Black. Mordant Varnish. Another. Another. Another. Another Superior Green Transparent Varnish. Etching Varnish.

SUPPLEMENT:—On Pattern Making—Contraction of Metals, etc. Conducting Heat of Brass and Iron. Varieties of Tombac. On Sand Core Moulding, Blackening, etc. On Washing Sweepings, Ashes, etc., from Brass Foundry Furnaces. Gilders' and Jewelers' Workshops, and Places where Metallurgic Operations are carried on. Cornish Refining Flux. Crude or White Flux. Black Flux. Cornish Reducing Flux. Imitation Silver Metal. On Case hardening Iron. Varnish for Iron. Varnish for Polished Iron. To preserve Gum Arabic Solutions. Best Composition of Brass for Rolling and Forging. Remarks on the Fluxing of Metals. Tinning Cast Copper or Brass. Table of Experiments on the Tenacity of Metals. On Reducing Copper with White Arsenic. Tin and Zinc. Tin and Iron. Copper, Tin, and Iron Alloy. Corinthian Bronze. Syracuse Bronze. Ship Nails, Composition, strong and durable. Chinese White Metals. Fenton's Anti-friction Metal. To make White Lacquer. On Iron, and some Improvements in its Manufacture. Table of Comparative Strength of Cast Iron. Table of Comparative Strength of Wrought Iron. On the Strength of materials—by C. A. Lee, C. E. Table of Strength of Materials. On the Strength of Iron—Cast Iron. Composition for Silvering Brass. Steel by the Bessemer Process—by A. L. Holly. To Silver Brass. Resistance to Compression. Table from Mr. Hodgkinson's Experiments. Static Pressure of Water under different Heads. Directions for Preparation and Fitting of Babbit's Anti-attrition Metal. Soldering Fluid for Soft Solder. Alloy of the Standard Measure used by Government. Tutenag. Expansion Metal.

Leavitt.—Facts about Peat as an Article of Fuel:

With Remarks upon its Origin and Composition, the Localities in which it is found, the Methods of Preparation and Manufacture, and the various Uses to which it is applicable; together with many other matters of Practical and Scientific Interest. To which is added a chapter on the Utilization of Coal Dust with Peat for the Production of an Excellent Fuel at Moderate Cost, specially adapted for Steam Service. By T. H. LEAVITT. Third edition. 12mo. $1 75

Leroux, C.—A Practical Treatise on the Manufacture of Worsteds and Carded Yarns:

Comprising Practical Mechanics, with Rules and Calculations applied to Spinning; Sorting, Cleaning, and Scouring Wools; the English and French methods of Combing, Drawing, and Spinning Worsteds and Manufacturing Carded Yarns. Translated from the French of CHARLES LEROUX, Mechanical Engineer and Superintendent of a Spinning Mill, by HORATIO PAINE, M. D., and A. A. FESQUET, Chemist and Engineer. Illustrated by twelve large Plates. To which is added an Appendix, containing extracts from the Reports of the International Jury, and of the Artisans selected by the Committee appointed by the Council of the Society of Arts, London, on Woollen and Worsted Machinery and Fabrics, as exhibited in the Paris Universal Exposition, 1867. 8vo. Muslin . . . $5 00

CONTENTS.—INTRODUCTION.—General glance at the Art of Spinning Wool; Machines used for Combed Wool (Worsted) and Combed Carded Wool.

PART I.—PRACTICAL MECHANICS APPLIED TO SPINNING. CHAPTER I.—Choice of a Motive Power; Arrangement of the Work Rooms; Arrangement of Machines. II. TRANSMISSION.—Driving Shafts; Table showing the Diameters of Bearings (Journals) for shafts submitted to torsional strain; Rule. III. BELTS.—Means for Determining the Dimensions of Belts; Thicknesses of Belts, Calculated from the Power they have to Transmit; Rule; Table for ascertaining the width of Belts; Rule; Coefficient of Transformation of the Width of Belts according to the Relations of the Diameters of Pulleys; Loss of Velocity suffered by Belts while in Motion; Table showing the Slip of Leather Belts relatively to their Lengths; Rule; Causes of the Destruction of Belts and Means of Remedying it; New Methods of Sewing the Couplings of Belts. IV. PULLEYS.—Shape of the Pulleys; Measure of Velocity; Calculation of Velocity. V. GEARING.—Rules. VI. OF FRICTION.—Alloy for Journal Boxes of Transmitting Shafts; Alloy for the Brasses of Drawing and Spring Frames; Alloy for Steps, Collars, &c.; Table showing the Ratio of Friction to Pressure for Axles moving in Journal Boxes; Rule; Nature of Lubricating Substances. VII. THE MOTIVE POWER. VIII. LEVERS.—Rules; Table of Numbers, showing their Squares and Square Roots, Cubes and Cube Roots; and also Circumferences and Areas of Circles of the same Numbers considered as Diameters.

PART II.—CHAPTER I. MANUFACTURE.—Table of Textile Materials. II. Sorting the Wool; Of Wool Bearing Animals; Improvement of Sheep; Varieties of Breeds; Character of Wool from different sources; Cleanness, Quality; Sorting or Separation into Qualities; Low Qualities; High Qualities; Cost and Loss in Sorting; Product in the Sorting of Wools from the Principal Sources; Comparison of Wools of Different Sources, with their Diameter and the corresponding Number of Yarns. III. BEATING.—Cost of Beating; Waste in Wools from Different Sources. IV. Cleaning the Wool of its Impurities; French Wools; Algerine Wools; Classification of Wools according to their Cleanliness; Different Combinations necessary for Cleansing Wool; Adjustments; Table of Intervals corresponding to the various Qualities of Wool; Method of Operating. V. WASHING.—Natural Grease; Marseilles Washing; Washing in the North of France; Analysis and Theory of Washing; Fatty matter contained in Wool; The Operation of Washing and Scouring; Another Method of Washing; Press Washing; The Operation; Washing in a Current of Warm Water; Method of Operating; Washing by a Current of Cold Water. VI. SCOURING.—Chemical Agents used for Scouring; Water—Inconvenience of Calcareous Waters—Means of Neutralizing them; Solution of Soap; Method of Scouring and Manipulation; Temperature of the Bath—Amount of Soap to be employed for each Quality of Wool; Table of the Proportion of Soap to be used in Scouring, and the Elevation of Temperature for Different Qualities of Wool; Yarn Scouring; Mode of Operation; Table showing the Quantities of Soap and the Elevation of Temperature for Scouring various qualities of Worsteds and Yarns; Rinsing; Wringing; Mode of Operating; Uses for Old Baths; Wool Picking; Drying. VII. OILING.—Disadvantages of not Oiling; Experiment upon the relative advantages of Oiling and not Oiling; First Experiment; Second Experiment; Oils to be employed; Properties and Specific Gravities of Oils; Composition for Oiling Wools; Table showing

the Quantities of Composition to be used according to the Qualities of Wool; Method of Oiling by Hand; Oiling by Machinery. VIII. MECHANICAL ARRANGEMENT OF A SET OF CARDS (BREAKERS).—Table showing the Velocities and the Diameters of the various parts of Breakers. IX. CARD CLOTHING.—Arrangement of the Rollers; Mode of Employing the Screw Slide Rest; Mode of applying the Card Sheets to the Main Cylinder; Method of applying Card Fillets to the Workers, Strippers, &c.; Rule; The Relation of Card Clothing to the Qualities of Wool; Table giving the Number of the Card Clothing corresponding to the various Qualities of Wool. X. GRINDING THE CARDS. XI. FLOCKING THE CARDS.—Price List of Card Clothing already stuffed and made by Messrs. Scrive Brothers, Lille. XII. CARDING.—Intervals between the Rollers, care to be observed in their adjustment; Method of adjusting the intervals for different Qualities of Wool; Table giving the intervals between the Card Rollers according to the various Qualities of Wool and the length of the Staple; Knots, Method of Preventing and Removing them; The Operation of Carding; Quantity of Wool Carded in Twelve Hours by a set of Two Breakers. XIII. THE GILL BOX. XIV. STRIPPING THE CARDS. XV. SCOURING AND DRESSING THE SLIVERS. XVI. Hand Combing; Machine Combing. XVII. PREPARATION OF WOOL FOR FRENCH SPINNING.—General Arrangement; Levers as applied to Preparatory Machines; Table showing the Weights and Arms of Lever which are in Equilibrium with a given Power; Table of the Pressures to be applied to the various Qualities of Wool on the Drawing Frame; Weighted Top Rollers; Caps or Top Clearers; Oiling the Machinery; Intervals; Rule; Table showing the Intervals in Preparatory Machines, according to the Quality of the Wool and the Length of the Staple; Parchments; Circular Combs (Porcupines); Table indicating the Diameter, Length, and Number of Pins in one Row, for Combs employed in Drawing Frames, and for the Number of Yarn to be produced; Movement of the Combs; Position of the Combs; Rotary Rubbers; Spool Drums; Hard Spools. FIRST PASSAGE.—First Drawing Frame; First Mounting; Second Mounting; Mode of Operation of the First Drawing Frame; Draughts and their Calculation; Analysis of the Draught on the First Drawing Frame; Rule; Calculation of the First Draught; Calculation of the Second Draught; Rule; Numbering of the Preparations; Rules; Table showing the Numbers of Preparations with the corresponding Weights; Rule; Result of the First Passage; Rule. SECOND PASSAGE.—Second Drawing Frame; First Head; Second Head; Third Head; Fourth Head. THIRD PASSAGE.—Third Drawing Frame; Steam as applied in the Drawing Process. FOURTH PASSAGE.—Fourth Drawing Frame; Cuttings; Barbs (Roller Waste); Piecing or Splicing; Waste. FIFTH PASSAGE.—Fifth Drawing Frame. SIXTH PASSAGE.—Sixth Drawing Frame. SEVENTH PASSAGE.—Seventh Drawing Frame. EIGHTH PASSAGE.—Eighth Drawing Frame; Doubling; Table showing the number of Slivers employed upon each Drawing Frame, the numbers of the drawn out Slivers, and the corresponding Draughts; Table of the Slivers or Rovings of Preparation with the corresponding Numbers of Yarn. XVIII. FRENCH SPINNING ON THE MULE.—Spinning Mule; Pressures given by the Top Rollers; Spindles; Carriage; Cuttings; Barbs (Waste); Spindle Cords or Bands; Breaks and Lashing (Running in); Winding up; Intervals; Draughts; Rule; Regulating the Number of the Yarn; Rule; Table showing the Number of Teeth of Change Pinions, for Numbers of Yarns between 10 and 90; Twisting; Rule; Table showing the Numbers of Yarn with the Degree of Torsion; Operation of Spinning; Cleaning; Sampling or Proving; Table showing the Numbers of Yarn with the corresponding Lengths and Weights; Table giving the Numbers of Yarn with their Weights, and the corresponding Slivers; Société Impériale d'Emulation d'Abbeville. Report of Vice-President on the Quadrate Scale of Charles Leroux.

PART III.—CHAPTER I. THE ENGLISH METHOD OF SPINNING.—The Drawing Processes. FIRST PASSAGE.—Sampling (Proving) the Preparations; Table showing the Weights of Slivers corresponding to the Numbers to be Spun; Weighing of the Preparations. SECOND PASSAGE. THIRD PASSAGE. FOURTH PASSAGE. FIFTH PASSAGE. SIXTH PASSAGE.—Rule. II. ENGLISH METHOD OF SPINNING CONTINUED.—Arrangement of the Spinning Frame (Throstle); Intervals; Top Rollers; Tensions; Twisting; Draughts; Rule; Cleaning and Oiling the Machine. III. FRENCH SPINNING ON THE THROSTLE. Preparations for the Throstle Frame; Spinning Frame (Throstle); Comparison of the System of Spinning; Doubling (Twining); Doubling on the Mule (Twining, Doubling Mule); Doubling on the Throstle Frame; Winding; Twisting the Hanks; Packing; Baling.

PART IV.—CHAPTER I. CARDED WOOL.—Glance at this kind of Manufacture; Preparations of Wools—How they are Used and Sorted; Scouring; End Twistings; Rag Picker; Beating; Cleaning; Oiling; Table showing the Quantity of "Composition" to be used for a certain Quantity and Quality of Wool; Picker. II. CARDING.—First Passage; Second Passage (Condensing). III. SPINNING.—Sampling and Numbering, Rules; Throstle Frame; Rules; Lighting the Spinning Mill.

APPENDIX.—WOOLLEN MACHINERY AND MANUFACTURES AS SHOWN IN THE UNIVERSAL EXPOSITION, PARIS, 1867. (Extracts from the Reports of the International Jury); From MM. Michel Alcan and Ed. Simons' Report—Processes for Cleansing Wool; Combed Wool; Carded Wool; From M. Larsonnier's Report—Productions Exhibited. MACHINERY FOR WORSTED FABRICS, ETC., BY JOHN FRENCH, Bradford. (Extract from the Reports of Artisans selected by the Committee appointed by the Council of the Society of Arts to visit the Paris Universal Exhibition, 1867); Class 55. Belgium; Manufacturing Machines in the French Department; France—Classes 55 and 56; Machinery from Roubaix; Visit to Rheims; TABLES SHOWING THE RELATIVE VALUE OF FRENCH AND ENGLISH WEIGHTS AND MEASURES. INDEX.

Leslie (Miss).—Complete Cookery:

Directions for Cookery in its Various Branches. By Miss LESLIE. 60th thousand. Thoroughly revised, with the addition of New Receipts. In one volume 12mo., cloth $1 50

Leffel.—The Construction of Mill Dams:

Comprising also the building of Race and Reservoir Embankments and Head Gates, the measurement of streams, gauging of water supply, etc. By JAMES LEFFEL & Co. Illustrated by 58 engravings. 1 vol. 8vo. $2 50

Lieber.—Assayer's Guide:

Or, Practical Directions to Assayers, Miners, and Smelters, for the Tests and Assays, by Heat and by Wet Processes, for the Ores of all the principal Metals, of Gold and Silver Coins and Alloys, and of Coal, etc. By OSCAR M. LIEBER. 12mo., cloth $1 25

CONTENTS.—Explanation of Technical and Scientific Terms; Introduction; Description of Implements and Utensils used; Assay of Silver Ores by Heat; Cupellation; a Table to rectify the Loss in the Silver Assay; Gay-Lussac's Process of Silver Alloys; Assays of Gold by Heat, by Quartation, by Amalgamation, by Washing, by a Wet Process; Assay of Silver Coins, or Alloys of Silver and Copper; Assay of Gold Coins, or Alloys of Gold, Silver, and Copper; to find the Proportion of Gold in a Mixture of Gold and Quartz by Calculation; Assay of Platinum Ores; Assay of Copper Ores by the German or Hungarian Method; Assay of Copper Ores by the English Method; Assays of Lead Ores by Heat and by a Wet Process; Assay of Iron Ores by Heat; Tack's Process for Iron Ores and Iron; Assays of Ores of Mercury; Assay of Sulphurets in Ores; Mode of Testing the Calorific Power of Coal and other Fuels; Tables.

Love.—The Art of Dyeing, Cleaning, Scouring, and Finishing, on the Most Approved English and French Methods:

Being Practical Instructions in Dyeing Silks, Woollens, and Cottons, Feathers, Chips, Straw, etc. Scouring and Cleaning Bed and Window Curtains, Carpets, Rugs, etc. French and English Cleaning, any Color or Fabric of Silk, Satin, or Damask. By THOMAS LOVE, a Working Dyer and Scourer. Second American Edition, to which are added General Instructions for the Use of Aniline Colors. In one volume 8vo. 343 pages. $5 00

CONTENTS. DESCRIPTION OF THE DYE-HOUSE.—The dye-house; coppers, tubs, vats, and cisterns, called dyer's plant.

CHAPTER I. The art of cleaning and dyeing silk. II. The art of dyeing and scouring wool. III. The art of dyeing and scouring cotton. IV. The art of cleaning and dyeing feathers, chip, straw, and Leghorn bonnets. V. The art of cleaning and scouring silk, woollen, and cotton fabrics; French cleaning; different soaps used by dyers and scourers.

APPENDIX.—General instructions for the use of aniline colors. General rules; rosaniline, solferino, or magenta crystals; cerise; sienna brown; blues soluble in alcohol; blues soluble in water; violets soluble in alcohol; violets soluble in water; iodine violets soluble in alcohol—Alexandra red and blue and Hofmann's violet; iodine violets soluble in water—Alexandra red and blue and Hofmann's violet; aniline green in paste or powder; prepared aniline green—silk, wool, and cotton; aniline black for printing and dyeing cotton; yellow and orange; green with picric acid and indigo carmine.

Main and Brown.—Questions on Subjects Connected with the Marine Steam-Engine:

And Examination Papers; with Hints for their Solution. By THOMAS J. MAIN, Professor of Mathematics, Royal Naval College, and THOMAS BROWN, Chief Engineer, R. N. 12mo., cloth $1 50

Main and Brown.—The Indicator and Dynamometer:

With their Practical Applications to the Steam-Engine. By THOMAS J. MAIN, M. A. F. R., Ass't Prof. Royal Naval College, Portsmouth, and THOMAS BROWN, Assoc. Inst. C. E., Chief Engineer R. N., attached to the R. N. College. Illustrated. From the Fourth London Edition. 8vo. $1 50

CONTENTS.—THE INDICATOR.—The Indicator scale; To graduate the Indicator scale; When the atmospheric line is to be traced; The use of the small hole in the side of the stop-cock; Method of taking a diagram; It is important to have means of shortening or lengthening the string attached to the Indicator; The pressure of the steam and the state of the vacuum on the diagram do not correspond with the boiler pressure and condenser vacuum; The part of the engine to which the string should be attached; On the general configuration of the diagram under given circumstances: The above curves exhibit what has been going on within the engine; the slide diagram; To reduce the motion of the slide when too great; To explain how an alteration in the length of the gab-lever affects the diagrams; To explain why the accompanying diagram has a different outline from the standard diagram; Top and bottom diagrams with the slide-rod lengthened; To find the nature of the curve, if the slide-rod be shortened; Top and bottom diagrams with the slide-rod shortened; The effect on the diagrams, if the stop on the eccentric be too far advanced; Top and bottom diagrams with the eccentric stop advanced; To ascertain, by inspecting the diagram, if the stop on the shaft be not sufficiently advanced; Top and bottom diagrams with stop of eccentric put back; Slide diagrams with eccentric stop wrongly placed; The nature of the diagram when the portways of the cylinder or the steam-pipe are too small for the size of the cylinder and the speed of the piston; Diagram obtained when the steam is throttled; On the force of the diagram when the expansive gear alone is used; Top and bottom diagrams when working expansively; To show the advantage of expansive working over throttling; The general outline of the diagram may appear satisfactory, notwithstanding the engine is not in good working order; On the series of steps in the upper right-hand corner of the accompanying diagram; To explain why, in certain cases, the steam-line (when the expansive gear is used) does not descend so rapidly as in the theoretical case; To ascertain the horse power of an engine by means of the Indicator; Where accuracy is required a diagram should be taken from the top and bottom of the cylinder; A diagram representing the relative motions of the slide and piston at every part of the stroke; To find, separately, the value to be given to the steam and vacuum pressures; To estimate the work done in a single stroke of the engine; Method of employing the Indicator for ascertaining the quantity of water evaporated by a boiler; To ascertain the friction of the steam-

engine when working without any load; The diagram does not necessarily return into itself, and form a closed figure; To explain why the first diagram is rounded at the upper left-hand corner; Indicator diagram taken when the engine is worked without condensation of the steam; High pressure diagram; Diagram obtained when there was no load on the safety valve; Air-pump diagram.

THE DYNAMOMETER.—Method of obtaining the effective horse power of an engine by the Dynamometer; Pressure of steam and the corresponding temperature and relative volume; Areas of circles of given diameters.

Main and Brown.—The Marine Steam-Engine.

By THOMAS J. MAIN, F. R. Ass't S. Mathematical Professor at the Royal Naval College, Portsmouth, and THOMAS BROWN, Assoc. Inst. C. E. Chief Engineer R. N. Attached to the Royal Naval College. Authors of "Questions connected with the Marine Steam-Engine," and the "Indicator and Dynamometer." With numerous illustrations. In one volume, 8vo.

$5 00

CONTENTS.—INTRODUCTORY CHAPTER.—Steam. Water. Caloric. Temperature. Heat and cold. General effects of heat and cold. Expansion by heat. Expansion of gases. Practical methods of observing expansion. Various applications of this principle. Law of expansion by heat not universal. Beneficial result arising from this anomaly. To show that the law fails in the foregoing case. To ascertain the temperature of any substance. Pyrometer. Thermometer. Method of graduating thermometers. To compare thermometers when differently graduated. Laws of cooling. Conduction. Conducting powers of bodies. The sensations a bad criterion of temperature. Convection. Advantages to be derived from a knowledge of this law. Explanation of some natural phenomena. Radiation. Radiating power of bodies—what it depends on. Land and sea breezes. Capacity for heat. Unit of caloric. Latent heat. Under what circumstances heat becomes latent. Heat the sole agent in melting and vaporizing bodies. Calorimeter. Sources of Heat. Heat generated by mechanical operations. Combustion. Temperature necessary for combustion. Oxidation. Effects of galvanic action. Boiling point. Boiling point as influenced by pressure. Temperature of steam. Vapor. Formation of dew. Causes influencing the formation of dew. Vapor and steam distinguished. Method of obtaining steam. Steam distinguished from other elastic fluids. Boiling point of fresh water. Boiling point of salt water. The steam of salt water is fresh. Process of Distillation. High-pressure steam. Measure of steam by atmospheres. Laws regulating the pressure of steam. Pressure, density, and temperature of steam. Specific gravity of steam. Common steam. Superheated steam. Analysis of sea-water, Saline contents of sea-water. Gaseous matter in sea-water.

CHAPTER II.—THE BOILER:—Marine boilers distinguished from land-boilers. Gear connected with boilers. The tubular boiler. The number of boilers in each steam-vessel. The steam-chest. The fire-bridge. Ash-pits. Gun-boat boilers. Exhaust-pipe. Blast-pipe. Feed or donkey engine. Boiler hand-pumps. The safety-valve. Gear attached to the safety-valve. Under what circumstances the weights of the safety-valves may be increased. The safety-valve box. Waste-steam funnel and drip-pipe. Steam-gauge. Steam-gauge for high-pressure boilers. Gauge-cocks. Boiler Water-gauge. Kingston's valves. Wash-plates or dash-plates. Dampers. The reverse-valve. Communication or stop valve. Blow-out cocks. Brine-pumps, brine-valves, and refrigerators. Surface blow-out pipes. Seaward's brine-valve. Brine and feed valves, as fitted at the factory, Portsmouth Dockyard.

CHAPTER III.—THE ENGINE:—Definition of steam-engine. Employment of the several methods. Engine in general use previous to Watt's improvement. Newcomen's engine. Discoveries of Watt. Blowing-through. Single-acting engine Double-acting engine. High-pressure or non-condensing engine. Marine steam-engine. Side-lever marine engine. Blow-valve. Stuffing-boxes, etc. Piston of steam-cylinder. Working parts of side-lever engines. Method of working slides. Strap, gib, and cutter. Escape-valves of cylinder. Parallel motion. Surface condensation. Test-cocks. Foot-valve not absolutely necessary. Annular air-pump bucket. Annular delivery-valve. Air-pump and common pump contrasted. Delivery-valve not always needed. Double-acting air-pump. Discharge or sluice valve. Various kinds of slides. Long

D-slide. Short D-slide. Locomotive slide. Seaward's slides. Cylindrical slides. Cushioning. Lead of slide. Lap of slide. Effect of lap. Working with and without lap contrasted. The eccentric. Throw of eccentric. Stops on the eccentric. To find the travel of the slide. Double-eccentric. Throttle-valve. Expansion-valve. Expansion valves. Hornblower's valve. Cornish double-beat. Equilibrium-valve. Valves of H. M. S. Penelope. Gridiron-valves. Other kinds of expansion-valves. Maudslay and Field's rotary expansion-valves. Condenser-gauge. Pressure in condenser by gauge. Errors in barometer-gauge. Mode of correcting ditto. Lubricators. Expansion-cams and gear. Feed-pumps. Bilge-pumps. Modes of propulsion. Paddle-wheels. Feathering-paddles. Reefing the paddles. Disconnecting the wheels. Methods of disconnecting paddle-wheels. Immersion of paddle-wheels. Paddle-wheel brakes. The screw-propeller. Definition—length of screw. Definition—angle of screw. Pitch of screw. Slip of screw. Area of screw. Thread of screw. Diameter of screw. Disconnecting the screw. Methods of raising the screw. Governors in screw-ships.

CHAPTER IV.—Direct-action engines. Gorgon engines. Length of radius-bar of ditto. Fairbairn's engines. Maudslay's double-cylinder engines. Boulton and Watt's direct engines. Messrs. Miller and Ravenhill's direct engines. Oscillating engines. Engines for working the screw-propeller. Direct-acting screw-engines. Direct-acting geared-engines. Oscillating horizontal engines. Trunk engines. Double-acting air-pump. Maudslay and Field's return connecting rod engine. Humphrey's engine.

CHAPTER V.—GETTING UP THE STEAM:—Filling the boilers. To know when the blow-out cocks are closed. On the proper height of water in the boilers when fires are first lighted. Laying the fires. To get up the steam expeditiously. Duties to engines, etc., while the steam is getting up. Injection-orifice choked up. To see the engine clear for starting. Foot-valve gagged. Starting the engines. Starting with one engine in gear. Working engines at moorings. On starting from moorings before the steam is well up. Steaming through an intricate passage on first starting. On opening the communication between a hot and cold boiler. Priming on first starting the engines. On priming while getting up the steam. Remedies against priming. Chilling effects of cold surfaces. Banking up the fires. Putting back the fires. Safety-valves to be closed when banking up. On the steam gauges of strange boilers. Attention to the jackets of steam-cylinders. To ascertain if blow-out cocks are opened.

CHAPTER VI.—DUTIES TO MACHINERY WHEN UNDER STEAM:—The boiler. Glass water-gauge. Blowing out. On the limit of saturation. The salinometer. Ash-pits to be kept clear of ashes. On stoking. Management of fires. Feeding the boilers. To prevent saturation of boilers under peculiar circumstances. Decrease in maximum boiler-pressure when the ship is rolling. Blowing-out to be limited at times. On the number of boilers to be employed. Superheating apparatus. Ashes escaping from the funnel. Flame appearing at the top of the funnel. On the supply of air to the fires. To prevent accidents if the water be low in the boilers. Effect on the steam from admitting a large supply of cold water. Attention to be paid to injection-pipes. Kingston's valves. Working as high-pressure engines. Injecting from the bilge. On leaks in the engines. Method of working engines with leaky slides. Leaky condensers or air-pumps. Attention to be paid to feed-pumps. Attention to be paid to dampers and ash-pit doors. Back-lash. Duties to bearings of engines. Soft metal for bearings. Expansive working. Steam-circle. Management of fuel. Previous notice to be given before stopping the engines.

CHAPTER VII.—DUTIES TO MACHINERY DURING AN ACTION, OR AFTER AN ACCIDENT:—Gear for repairing damages during an action. Machinery to be examined before an action. Precautions against fire. Regulation of fires during an action. Casualties to paddle-wheels during an action. Effect of shot upon funnels. Remedies proposed if shot enter the boiler. Regulation of the steam during an action. Temporary repairs to a boiler. Temporary repairs of a steam-pipe or a feed-pipe. Method of working one engine. Remarks on screw propeller. To clear the bilge of a vessel. Precautions in case a vessel be run ashore. Temporary repair of boiler tubes. Steamers in chase. To repair the funnel after an action. To straighten a bent piston rod. To work engines without cylinder-covers.

CHAPTER VIII.—DUTIES TO ENGINE, ETC., ON ARRIVING IN HARBOR:—Blowing out the water. Hauling out fires. Duties to engines on arriving in port. Lubricators to be examined. Bearings to be examined. Remarks on the outer bearings of paddle-shafts. Remarks on piston-glands, keys, etc. On screwing down the "holding-down bolts." On examining, repacking, etc., slides. To find the length of stroke of an engine. To adjust the parallel motion of engines. To adjust paddle-shafts. To set slides. To adjust eccentric-rod. Remarks on alteration of the slides. On cleaning out and scaling the boiler. Rust-joints. On stopping cracks in boilers, etc. On repairing the fire-bridges and ash-pits. On staying the boilers. On increasing the load in the safety-valve. Boiler water-glass. On the internal feed-pipe. The steam-gauge to be ex-

amined occasionally. On replacing the fire-bars. On sweeping the funnel. Coal-hunkers to be examined. Coaling ship. Rubbish to be carefully removed after repairs. Danger from impure air in boilers. Screw gearing in screw-steamers. Lubricating the gearing of screw-vessels. Paddles. Preserving boilers when not in use. On fitting mud-hole doors. On getting up steam at frequent intervals. On turning round the wheels by hand. On turning the engines of screw-vessels. Raising cylinder-covers by tackles. To get a cylinder-cover into its place. To ascertain if the piston be steam-tight. Piston loose on the rod. Method of separating parts of an engine when rusted together. To blow-through when a blow-valve is not fitted. Process of blowing-through, etc., delayed by cold. Attention to engines of screw-vessels.

Chapter IX.—Miscellaneous:—Measure of efficiency of engines. Duty of an engine. Horse-power of an engine. Nominal horse-power. Horse-power from the evaporation, etc. On the screws of steam-vessels. Approximate area of a screw-blade. To find the angle of a screw-blade. To find the pitch of a screw-blade. Requisite pitch for a given speed of a screw. To find the pitch from the speed of ship and the slip. Area of screw-blade (accurately). Power exerted by a screw. Slip of the screw. Best speed in a tide-way. Motion of paddle-steamers in still water. Consumption of fuel in a given time On the consumption of fuel between two ports. On reefing paddles. Measure of performance of engines. On the motion of the crank. Work developed by a crank in one revolution. Length of radius-bar. Amount of work in one stroke of air-pump. Amount of fuel lost by blowing-out. Best temperature of a condenser. On the qualities of fuel. Weight of coal when used as fuel. Patent fuel. Effect of stowage on coals. Decay of coals. Qualities of coals suited to navigation. *Table I.*—Power and duty, etc., of various coals. *Table II.*—Mean composition of average samples of various coals. *Table III.*—Average value of coals from different localities. *Table IV.*—Average composition of coals from different localities.

Appendix.—To find the circumference of a circle. To find the area of a circle. To find the surface of a cylinder. To find the volume of a cylinder. To find the surface of a sphere. To find the volume of a sphere. To find the volume of a cone. Circular inch and square inch. To find the area of an ellipse. To find the circumference of an ellipse. Definition of frustum of a cone. To find the volume of a frustum. To find the weight of any substance. Useful rules to be observed when coaling. *Table A.*—Pressures of steam, and the corresponding temperatures and relative volumes. *Table B.*—General effects of heat according to certain temperatures. *Table C.*—Of the linear expansion of solid bodies by heat. Expansion of fluids by heat. *Table D. Table E. Table F.*—Of capacities of bodies for heat referred to water as the standard. *Table G.*—Mechanical properties of Materials. *Table H.*—Circumferences and areas of circles of given diameters. *Table I.*—To find the pitch of a screw from the angle and diameter. *Table K.*—Knot table. Screw-steamers in her Majesty's Navy. Paddle-steamers in her Majesty's Navy. List of steam gun-boats in the Royal Navy.

Alphabetical Index.

Mechanics' (Amateur) Workshop:

A treatise containing plain and concise directions for the manipulation of Wood and Metals, including Casting, Forging, Brazing, Soldering, and Carpentry. By the author of the "Lathe and Its Uses." Third edition. Illustrated. 8vo. $3 00

Contents.—Introduction—Blowpipe Manipulation; Griffin's Blowpipe; Brazing; Brass Turning; Brass, to Lacquer; Bronzing; Casting Flasks and Patterns; Case-hardening; Cored Works; Chasing Screws; Cast-iron, to Tin; Cost of Lathes; Cutting Teeth of Wheels; Dovetailing; Drilling Metal; False Cores for Casting; Filling; Forge Tools; Fluxes for Soldering; French Polishing; Polish Finishing; Gluing; Griffin's Lamp Furnace; Gold Solders; Hardwood Turning; Hardening and Tempering; Ivory, to Turn; Iron Turning; Lathe, Description; Lathe, Details; Lathe Chucks; Lathe, Overhead Motion; Lacquering; Malleable Castings; Metal Turning; Making Solder for Tin; Mounting Grindstones; Naysmith's Hand Drill; New Tool for making Screws; Overhead Gear for Lathes; Plumber's Work on Lead; Principles of Cutting Tools; Scientific Construction of Tools; Screw Stock and Dies; Screw Plate; Screw Cutting in the Lathe; Sharpening and Grinding Tools; Slide Rest; Small Furnaces for Casting; Softening Steel; Staining Woods; Spiral or Elizabethan Twist; Surfacing Soft Woods; Substances for Polishing; to Hollow Soft Woods; Tools for Surfacing Soft Woods; Wheel Cutting; Wood Turning; Workbench Fittings; Welding Iron; Working in Sheet Metal; Whitworth's Die Stocks.

Martin.—Screw-Cutting Tables, for the Use of Mechanical Engineers:

Showing the Proper Arrangement of Wheels for Cutting the Threads of Screws of any required Pitch; with a Table for Making the Universal Gas-Pipe Thread and Taps. By W. A. MARTIN, Engineer. 8vo. .50

Molesworth.—Pocket-Book of Useful Formulæ and Memoranda for Civil and Mechanical Engineers.

By GUILFORD L. MOLESWORTH, Member of the Institution of Civil Engineers, Chief Resident Engineer of the Ceylon Railway. Second American, from the Tenth London Edition. In one volume, full bound in pocket-book form $2 00

CONTENTS.—Scale for plans deposited under standing orders; Chain surveying; Inaccessible points; Marine surveying; Levelling with thermometer; Levelling with mountain barometer; Formulæ for setting out railway curves; Table for tangential angles for 1 chain chords; Rails for curves; Approximate rule for bending rails; Elevation of outer rail on curves; Another rule; Rules for the versed sines and ordinates of curves; Formulæ for constructing tables of earthwork; For both slopes; For central part; Prismoidal formula; Earthwork—Angles of slopes; Natural slopes of earths, with horizontal line; Earthwork; Blasting; Weight of earths, rocks, etc.; Retaining walls; Reservoir dams; Masonry dams; Brickwork; Mortar, cement, etc.; Plastering; Table of culverts for railways; Asphalte flooring; Approximate rules for thickness of arches; Large arches; Rules sometimes used for railway bridges; Loads on railway bridges; Permanent loads on bridges, etc.; Safe load in structures, including weight of structure; Relative strength of beams or girders; To cut the best beam from a log; Strength of rectangular beams, supported at both ends; Strength of cylindrical beams, supported at both ends; Continuity of girders; Cast-iron girders; Breaking weight of cast-iron girders; Wrought-iron girders; Bowstring bridges; Cast-iron arches; Lattice bridges; Approximate rule for the strength of iron struts; Warren's girder; Weight of Warren's girders; Suspension bridges; American truss bridge; Tunnels, from actual practice in brick-work; Load on roofs, exclusive of framing; Slates—Table of sizes and weights of slates, exclusive of laths; Angles of roofs; Corrugated iron roofing; Strength of columns; Long columns; Relative strength of materials in long columns; Strength o. short columns; Wooden pillars; Approximate rule for the dimensions of wooden pillars; Approximate rule for the strength of rectangular pillars of wood; Wooden roofs; Scantlings of Purlins and rafters; Fire-proof floors, French system, with wrought-iron rolled beams; Strength rolled iron beams; Table of wooden flooring, joists, etc.; Proportion of steps in staircases; Strains on roofs; Rule for strains on iron roofs; Computation of strains on roofs by construction; Thickness of walls of buildings; Warehouses; Pile driving; Sheet piling; Ringing engines.

RAILWAYS.—Regulations for construction of Prussian railways and rolling stock; Railway; Level crossings and stations; Locomotive sheds; Carriage sheds; Locomotives; Carriages and wagons; Memoranda on English railways; Parliamentary regulations for railways crossing roads; Limits of Deviation; Deviations of level; Deviations of gradient; Deviations of curve; Gauge of railways; Rules for weight of rails; Memoranda on rails, etc.; Points and crossing; Table of gradients; Resistance of trains; Tractive power of locomotives; Effective pressure of steam on piston; Rule to find the load which an Engine will take on a given incline; Adhesive power of locomotives; Distribution of weight in locomotives; Working expenses of railways; Rolling stock; Roads; Traction on roads; Tractive force for horses; Paved roads; Canals; Maximum power of a horse on canals at different speeds; Navigable rivers; Obstructions in rivers; Table of rise of water occasioned by obstructions; Docks; Pressure of Lock gates, etc.; Iron piles for retaining walls; Pressure on Sluices.

WATERWORKS.—Rain-fall; Cast-iron pipes—Pressure in; Rule for finding the weight of cast-iron pipes; Pumping engines; To find the Diameter of a single acting pump; Useful numbers for pumps; Filters for waterworks; Delivery of water in pipes; Hawksley's formula for the delivery of water in pipes; Discharge of water from orifices, sluices, etc.; Gauging water; Scour of watercourse beds.

SEWERS.—Flow of water in sewers; Egg-shaped sewers; Internal dimensions; Proportions of oval sewers; To determine the thickness of brickwork.

Gas Works, etc.—Motion of gas in pipes; Service for lamps; Dimensions of mains, with weights of one length; Purifiers; Products of coal; Drainage of lands; Ventilation; Warming by steam; Warming by hot water; Light; Decomposition of light; Sound; Heat; Thermometer; Comparative scale of English and French thermometers; Specific gravity; To find centre of gravity; Centre of percussion—Distance from centre of motion; Centre of gyration; Centrifugal force; Vibrations of the pendulum; Gravity: Table of velocity of falling bodies; Falling bodies—Velocities due to different heights; Mechanical powers; Millwork; Strength of teeth of wheels; Proportions of teeth of wheels; Construction of the teeth of wheels; Epicycloidal teeth; Nature of curves of teeth; Teeth of wheels; Toothed wheels—Rules for the diameter and pitch; Table of multipliers; Diagram showing method of forming epicycloidal teeth; To delineate the required curves by construction; Pitches of equivalent strength for the teeth of wheels in different materials; Shafting; Relative powers of metals to resist torsion; Relative powers of different sections to resist torsion; Strength of shafting to resist torsion; Supports for ordinary shafting; Strength of shafting to resist lateral stress; Table of shafting—Necks and couplings; Pulleys; Leather belting; High speed belting; Pedestals, or plummer blocks; Steps, or braces of plummer blocks; Coefficients of friction in axles; Friction of plane surfaces; Rule for finding the weight of castings or forgings by the weight of their patterns; Table of hexagon nuts and bolt-heads; Screws—Table of Whitworth's screws; Dimensions of eyes of wheels and pulleys (staked); Shrinkage of castings; Alloys; Flukes for soldering or welding.

Workshop Recipes, etc.—Antifriction grease; Foundry recipes; Parting sand; Loam; Blackening for moulds; Blackwash; Mixture for welding steel; Tempering steel; Brazing; Rust joint cement (quickly setting); Rust joint (slowly setting); Red lead cement for face joints; Casehardening; Casehardening with prussiate of potash; Casehardening mixtures; Glue to resist moisture; Marine glue; Glue cement to resist moisture; Dubbing; Cement for cloth or leather; Iron lacquer; Brass lacquer; Temperature and volume of saturated steam; French metre reduced to English inches; Expansion of steam: Mercurial gauge; Table of steam used expansively; Terminal pressure; Surface condensation; Combined steam; Boilers; General memoranda; Relative value of heating surface; Boilers—Land; Mountings for a nominal 30-HP boiler; Proportions of cocks; Rules for heating and grate surfaces; Table of dimensions of cylindrical boilers; Area of chimneys; General rules for brick chimneys; Steamboat funnels; Tubular boilers; Marine boilers; Strength of boilers; Strength of cylindrical boilers; Staying boilers; Staying locomotive boilers; For top stays for locomotive fire-boxes; Giffard's injector; Riveting for boilers; Bridge riveting; Fuel—Average evaporative power; Animal power; Indicated horse-power of engines; Admiralty rule for horse-power; Admiralty nominal velocity of piston for paddle-wheel engines; Admiralty knot; Ordinary rules for nominal horse-power; Duty of engines; Lap and lead of the slide valve; Nominal horse-power of high-pressure engines; Dimensions of stationary condensing engines; Dimensions of marine side-lever engines; Table of direct-acting screw engines; Safety-valves; Proportions of safety-valve, levers, etc.; General rules for engines; Friction of engines unloaded; Steam-engine Governor; Parallel motion; To find the versed sine of the arc described by the beam of an engine; Approximate rules for the proportions of stationary condensing engines; Condensing water; Feed water; Cold water and feed pumps; Proportion of engine beams; Rule for the sectional area of the beam at centre; Weight of rim of fly wheel; Approximate rules for the proportions of side lever marine engines (low pressure); Approximate rules for the proportions of locomotives; Proportions of locomotives heating and grate surfaces; Surface of tubes; Thickness of metal in cylinders; Dimensions of locomotives; Rule for the lap and lead of locomotive slide; Rule for the strength of locomotive springs; Rule for the centre of gravity of locomotives; Railway carriages; Ordinary narrow gauge wagons.

Water Power, etc.—Memoranda connected with water; Time employed in filling and emptying cisterns when the supply and consumption are going on at the same time; Time required for a cistern with vertical sides to empty itself, the water flowing from an orifice in the bottom; Theoretical velocity due to different heads of water; Table of theoretical velocities of water flowing from orifices; Undershot water wheel; Poncelet's undershot water-wheel; Floating mill-wheels; Effective power of floating mills; Breast and overshot wheels; Velocity of Periphery; Distance of buckets apart; Openings of Buckets; Approximate rule for the number of Buckets; Forms of buckets; Three part buckets; Gudgeons of water-wheels; Forms of buckets (curved); Overshot and breast wheels; Fairbairn's ventilating buckets; Turbines—Jonval's low-pressure; Diagrams illustrative of Jonval's turbine; Construction of buckets; Buckets; Guides; Table of low-pressure turbines, from actual practice; Diameter of upright shaft; High-pressure turbines—Fourneyron's; Construction of buckets and guides; High-pressure turbines; Thickness of metal in wrought-iron supply pipes; Hydraulic ram; Water-

pressure engines; Power of pressnre engines; Force of the wind; To find the force of the wind; Windmills—Rule for the angles of the sails; Ordinary dimensions of windmill sails; Horse-power and sail area windmills; Approximate rules for speed of paddle steam-ships; Diameter of paddle wheels; Area of floats; Immersion of floats; Slip of paddle wheels; Proportions of paddle steam-ships; Screw propellers; Rule for the speed of screws; Approximate rule for the speed of screw steam-ships; Proportion of screw propellers; Pitch of screw; For two-bladed screws; Tonnage of vessels; Blowing engines, Centrifugal fans; Proportions of fans; Power required for fans; Centrifugal pumps (Appold's); Size of pipes of centrifugal pumps; Dynamometer; Iron-works (in Wales); Power required for different purposes; Dimensions of blast furnaces; Rule for change wheels in screw-cutting lathes; Power required to punch boiler plates; Dredging machines; Corn mills; Wood-working machinery; Depreciation of machinery; Mining machinery; Winding engines; Cranes; Power gained by blocks; Computation of the strains on a crane by construction; Jets of water under pressure; Weights and measnres; Sizes of Drawing paper; Measnres of timber; Timber Measuring; Decimal equivalents of inches, feet, and yards; Decimal equivalents of lbs., qrs., and cwt.; Decimal equivalents of pence and shillings; French decimal system; Comparative scale of English and French weights and measures; Foreign money, weights and measures, compared with English; Logarithm of numbers from 0 to 1000; Properties of triangles; Trigonometrical expressions; Trigonometrical eqnivalents; Natural sines, &c.; Logarithmic sines, &c.; Ellipse; To constrnct an ellipse by ordinates; To calculate any ordinate; Properties of the circle; Segment of circle; Parabola; Construction of parabolic curve; Cycloidal curve; Construction of the cycloidal curve; Mensuration of surfaces; Segment areas; Mensnration of solids; Table of polygons; Table of polyhedrons; Areas of circles; Circumferences of circles; Properties of metals; Strength of iron; Tenacity of wrought iron; Timber; Miscellaneous; Fluids; Gases; Artificial substances; Stones, earths, etc.; Modulus of elasticity; Weight and strength of round ropes of hemp and wire; Weight and strength of flat ropes of hemp and wire; Weight and strength of hemp rope; Rule for the weight of pipes; Weight of pipes; Birmingham wire gauge, compared with inches; Weight of a lineal foot of flat bar iron; Weight of a lineal foot of ronnd and square bar iron; Weight of nuts and bolt-heads; Weight of a square foot of sheet metals; Weight of a superficial foot of plates, different metals; Weight of cast-iron balls and solid cylinders; Weight of ordinary angle iron; Strength and weight of chains; Nnmbers raised to the 3.6th and to the 1.7th powers; Squares, cubes, square roots, and cube roots; Table of the fourth and fifth powers of nnmbers; Reciprocals of numbers; Links reduced to feet and decimals; Wrought-iron girders; Gauging the Metalling; Board of trade regulations for railways; Force of water; Safe load on chains; Giffard's injector; Joule's mechanical eqnivalent of heat; Rules for the elastic force of steam; Measurement of heights; Railway sidings; Decimal equivalents of a degree; Decimal equivalents of pounds and ounces; Decimal equivalents of the divisions of a foot; Sizes and weights of sheet tin; Useful numbers for rapid approximation; Weights, measures, etc.; Weight of metals; Wronght-iron; Various metals; Rainfall; Speed of trains; Steam-ships; Useful numbers for pumps; Useful memoranda connected with water; Useful numbers for weight of pipes; Standard water pipes; Hydraulic press; Brickwork; Hoop iron; Railway curves; Relative value of useful angles to angle of intersection; Setting out with two Theodolites.

SUPPLEMENT.—By J. T. Hurst, C. E.—Railway curves; Table of Tangential angles for chords of 1 foot to 100 feet; Measurement of earthwork; Mining; Approximate rules and tables for the thickness of arches and abutments; Table of the thickness required for the crowns of arches; Table of the minimnm thickness of abutments for bridge and similar arches; Cast-iron columns; Hollow columns; Flow of water through pipes and conduits; Cylindrical pipes; Egg-shaped sewers; Table of the power required to raise water from deep wells; Gas; Tables of the supply of gas through pipes; Rules for the stiffness of beams; Triangles: Casks; To measure heights with the sextant; To find the distance in feet when the angle subtended by 1 foot at that distance is known; Table showing the quantity of mortar produced by one imperial bushel of various limes and cements; Table of the properties of saturated steam; Hyperbolic logarithms; Table of knots and statute miles; Table of admiralty knots and statute miles; Index.

Orton.—Underground Treasures:

How and Where to Find Them. A Key for the Ready Determination of all the Useful Minerals within the United States. By JAMES ORTON, A.M. Illustrated 12mo. $1 50

Napier.—A System of Chemistry Applied to Dyeing:

By JAMES NAPIER, F. C. S. A New and Thoroughly Revised Edition. Completely brought up to the present state of the Science, including the Chemistry of Coal Tar Colors, by A. A. FESQUET, Chemist and Engineer. With an Appendix on Dyeing and Calico Printing, as shown at the Universal Exposition, Paris, 1867. Illustrated. In one volume 8vo., 422 pages. Price $5 00

CONTENTS. GENERAL PROPERTIES OF MATTER. HEAT—Conditions of matter, heat the cause of conditions of matter, general effects of heat, measures of temperature, boiling of liquids, substances affecting boiling point, strong boiling, chemical effects of heat upon colors. LIGHT—Nature of light, relation of colors to the fabric, effects of different rays upon colors, effects of light causing combination, light decomposes chemical compounds, practical application of the principles, harmonizing colors. ELEMENTS OF MATTER—differences between an element and compound, use of symbols, nomenclature, rules for naming compounds, salts—their nature and nomenclature. CHEMICAL AFFINITY—Application of affinity, circumstances influencing affinity, catalytic influence, constitution of salts, salt radicals.

ELEMENTARY SUBSTANCES. OXYGEN—How to make oxygen gas, properties of oxygen. HYDROGEN—Water, binoxide of hydrogen. NITROGEN—Protoxide of nitrogen, binoxide of nitrogen, nitrous acid, peroxide of nitrogen, nitric acid, table of the quantity of acids in 100 parts by weight, ammonia. CHLORINE—Hypochlorous acid, hypochloric acid, chloric acid, hyperchloric acid, hydrochloric acid, chloride of nitrogen, bleaching, ozone. SULPHUR—Sulphurous acid, sulphuric acid, hyposulphurous acid, hyposulphuric acid, sulphuretted hydrogen. SELENIUM. PHOSPHORUS. IODINE. BROMINE. FLUORINE. SILICIUM. BORON. CARBON—Carbonic oxide, carbonic acid, oxalic acid, cyanogen, mellon.

METALLIC SUBSTANCES.—GENERAL PROPERTIES OF METALS. POTASSIUM—Potash, sulphate of potash, bisulphate of potash, sulphite of potash, nitrate of potash, chlorate of potash, phosphate of potash, oxalate of potash, ferrocyanide of potassium, ferricyanide of potassium, cyanide of potassium, cyanate of potash. SODIUM—Soda, soda-ash, sulphate of soda, chloride of sodium, nitrate of soda, borate of soda, phosphate of soda. LITHIUM. SOAP. BARIUM. STRONTIUM. CALCIUM—Caustic lime, sulphate of lime, carbonate of lime. MAGNESIUM—Magnesia. ALUMINUM—Alumina, alum, sulphate of alumina, alum cake, aluminate of soda, acetate of alumina. MANGANESE—Mineral cameleon. IRON—Sulphate of iron, chloride of iron, carbonate of iron, acetate of iron, persulphate of iron, nitrate of iron, protosalts, persalts of iron. COBALT. NICKEL—Sulphate of nickel, chloride of nickel, nitrate of nickel, carbonate of nickel. ZINC—Chloride of zinc, sulphate of zinc, nitrate of zinc. CADMIUM. COPPER—Protoxide of copper, sulphate of copper, nitrate of copper, chloride of copper, acetate of copper, oxalate of copper, arseniate and the arsenite of copper. LEAD—Suboxide of lead, protoxide of lead, peroxide of lead, carbonate of lead, nitrate of lead, acetate of lead, sulphate of lead, chloride of lead, testing the value of lead salts. BISMUTH—Nitrate of bismuth. TIN—Protoxide of tin, protochloride of tin (salts of tin), protosulphate of tin, protonitrate of tin, tartrate of potash and tin, stanno-arsenite of soda, deutoxide or sesquioxide of tin, peroxide of tin, perchloride of tin, spirits, red spirits, plumb spirits, barwood spirits, yellow spirits, acetate of tin, oxalate of tin. TITANIUM. CHROMIUM—Chloride of chromium, sulphate of chromium, chromic acid, bichromate (red chromate) of potash, chromate of lead, chrome yellow, chrome greens, chrome orange, tests for bichromate of potash. VANADIUM. TUNGSTENUM, or WOLFRAM. MOLYBDENUM—Peroxide of molybdenum, molybdic acid. TELLURIUM—Tellurous acid, telluric acid. ARSENIC—Arsenious acid, arsenic acid, sulphurets of arsenic. ANTIMONY—Oxide of antimony, sulphate of antimony, antimonious acid, antimonic acid. URANIUM—Protoxide of uranium, peroxide of uranium. CERIUM. MERCURY—Suboxide of mercury, protoxide of mercury—peroxide of mercury. SILVER—Nitrate of silver, sulphate of silver. GOLD—Subchloride of gold, perchloride of gold. PLATINUM. PALLADIUM. IRIDIUM. OSMIUM. RHODIUM. LANTHANIUM.

TEXTILE FIBRES—Cotton, flax, hemp, silk, wool, generalities on textile fibres.

MORDANTS. RED SPIRITS. BARWOOD SPIRITS. PLUMB SPIRITS. YELLOW SPIRITS. NITRATE OF IRON. ACETATE OF IRON AND ALUMINA. ACETATE OF ALUMINA. BLACK IRON LIQUOR. IRON AND TIN FOR ROYAL BLUE. ACETATE OF COPPER.

VEGETABLE MATTERS USED IN DYEING. INTRODUCTORY REMARKS. GALLS. SU-

MACH. CATECHU.—Valonia nuts, divi divi, myrobalans. INDIGO—Manufacture of indigo, testing of indigo, commercial indigoes, characteristic of indigo, indigo dyeing, sulpho-purpuric acid, sulphate of indigo, indigo extract, the blue vat, woad and pastel, indigo blue, pastel vat, woad vat, modified pastel vat, Indian vat, potash-vat, German vat, management of the vats. LOGWOOD. BRAZIL-WOODS. SANTAL OR SANDAL WOOD. BARWOOD. CAMWOOD. FUSTIC OR YELLOW WOOD. YOUNG FUSTIC. BARK OR QUERCITRON. FLAVINE. EXTRACTS OF WOODS. WELD OR WOLD. TURMERIC. PERSIAN BERRIES. SAFFLOWER OR CARTHAMUS. MADDER—Levant madder, Dutch madder, Alsace madder madder of Avignon, madder purple, madder red, madder orange, madder yellow, madder brown, madder acids, useful products, madder preparations, chlorine, coloring principles of madder, tests for madder. MUNJEET. ANNOTTA OR ARNOTTO. ALKANET ROOT. ARCHIL.

PROPOSED NEW VEGETABLE DYES. SOORANJEE. CARAJURU OR CHICA. WONGSHY. ALOES. PITTACAL. BARBARY ROOT.

ANIMAL MATTERS USED IN DYEING. COCHINEAL—CARMINE. LAKE LAKE OR LAC. KERMS OR KERMES. MUREXIDE.

COLORS DERIVED FROM COAL TAR.—Production of coal tar, composition of coal tar, distillation of coal tar, aniline, theory of aniline colors, aniline reds, aniline blues and violets, aniline yellows, aniline greens, aniline blacks and grays, aniline browns and maroons. COLORS DERIVED FROM CARBOLIC OR PHENIC ACID. COLORS DERIVED FROM NAPHTHALINE. REMARKS IN GENERAL ON COAL TAR COLORS. REMARKS IN GENERAL ON DYEING WITH COAL TAR COLORS. DETERMINATION OF THE COLORING POWER AND NATURE OF ANILINE COLORS. IDENTIFICATION OF ANILINE COLORS.

APPENDIX. DYEING AND CALICO PRINTING AS SHOWN IN THE UNIVERSAL EXPOSITION, PARIS, 1867—Extracts from the Reports of the International Jury, and from other sources. GLOSSARY OF TECHNICAL TERMS USED IN THE DYE-HOUSE WITH THE CHEMICAL NAMES. INDEX.

Napier.—Manual of Electro-Metallurgy:

Including the Application of the Art to Manufacturing Processes. By JAMES NAPIER. Fourth American, from the Fourth London edition, revised and enlarged. Illustrated by engravings. In one volume, 8vo. $2 00

CONTENTS.—HISTORY OF THE ART.—DESCRIPTION OF GALVANIC BATTERIES AND THEIR RESPECTIVE PECULIARITIES :—Nomenclature. Proposed terms. Batteries. Single pair of plates. Best kind of zinc. Amalgamation of the zinc plates. Economy in amalgamation. Distance between the battery plates. Different elements of batteries. Properties of metals fit for batteries. Babington's battery. Wollaston's battery. Modifications of Wollaston's battery now in use. Defects of common acid batteries. Daniell's battery. Grove's battery. Bunsen's battery. Smee's battery. Earth battery. Magneto-electro machine.

ELECTROTYPE PROCESSES :—Single-cell operations. Preparation of the coin. Forms of apparatus. Comparative view of exciting solutions. How often solutions should be changed, and zinc amalgamated. Making of moulds. Preparation of wax. To take moulds in wax. Rosin with wax. Moulds in plaster. Moulds in fusible alloy. Moulds in gutta-percha. Moulds from ferns, seaweeds, etc. Nature printing. Casting of reptiles, etc. Wax moulds from plaster. Mould of plaster from plaster models. Fusible alloy from plaster. Copper moulds from plaster. Elastic moulding. Mould ing of figures Figures covered with copper. The preparation of non-metallic moulds to receive deposit. Using metal moulds. Precautions on putting moulds into a solution. Deposit on large objects. To make busts and figures. Coating of flowers, etc. Figures from elastic moulds. Electrotypes from daguerreotypes. Depositing by separate battery. Size of the electrodes. Relative power of batteries. Constancy of batteries. Comparative power of batteries. Recovery of mercury from waste zinc. Compound cell process. Effects of Resistance. Intensity. Relative intensity of batteries. Mode of suspending objects in coating. Non-transfer of elements. Effects of difference in the density of solutions. Crystals of copper on electrodes.

MISCELLANEOUS APPLICATION OF THE PROCESS OF COATING WITH COPPER :—Coppered cloth. Calico-printers' rollers. Etching of rollers. Printing. Glyphography. Instruction on Glyphography for the amateur. Copying of copper-plate engravings. Coating of glass and porcelain. On galvanic soldering. Galvano-plastic niello.

BRONZING :—Brown bronzes. Another method. Black bronzes. Green bronzes.

DEPOSITION OF METALS UPON ONE ANOTHER :—Coating of iron with copper. Cyanide of potassium. Cyanide of copper. Peculiarities of working cyanide of copper solution. Preparation of iron for coating with copper. Effects of conducting power in

solutions and metals. Illustration of conduction. Non-adherence of deposit. Coating cast-iron with other metals. Coating of iron with zinc. Sulphate of zinc. Use of zinc coating. Influence of galvanism in protecting metals from destruction by oxidation and solution.

ELECTRO-PLATING :—To make silver solution. Cyanide of silver dissolved in yellow prussiate of potash. Solution made with oxide of silver. Solution made with chloride of silver. The best method of making silver solutions. Hyposulphite of silver solution. Sulphite of silver-plating solution. To recover silver from solution. Preparation of articles for plating. Practical instructions in plating. Taking silver from copper, etc. Cyanide of silver and potassium—decomposition during the plating process. Other effects produced in working. Machine for moving goods while subjecting to the electro-plating process. Opposite currents of electricity from vats. Tests for the quantity of free cyanide of potassium in solutions. Rate of depositing silver. Bright deposits. Different metals for plating. Electricity given off from sandy deposits. The old method of plating. Advantages of electro-plating. Objections to electro-plating. Solid silver articles made by the battery. Dead silvering for medals. Oxidizing silver. Protection of silver surface. Cleaning of silver.

ELECTRO-GILDING :—Preparation of solution of gold. Battery process of preparing gold solution. Process of gilding. Conditions required in gilding. Maintaining the gold solution. To regulate the color of the gilding. Coloring of gilding. To dissolve gold from gilt articles. To recover the gold. Objections to electro-gilding. Effects of cyanogen on health. Practical suggestions in gilding. Deposition of bronze.

RESULTS OF EXPERIMENTS ON THE DEPOSITION ON OTHER METALS AS COATINGS :—Coating with platinum. Coating with palladium. Coating with nickel. Antimony, arsenic, tin, lead, bismuth, and cadmium. Iron. Lead. Aluminum and silicium. Tin. Antimony. Deposition of alloys.

THEORETICAL OBSERVATIONS :—Action of sulphate of copper on iron. Faraday's theory of electrolysis. Graham's theory of electrolysis. Daniell's and Miller's views. Proposed theory.

Newbery.—Gleanings from Ornamental Art of every style;

Drawn from Examples in the British, South Kensington, Indian, Crystal Palace, and other Museums, the Exhibitions of 1851 and 1862, and the best English and Foreign works. In a series of one hundred exquisitely drawn Plates, containing many hundred examples. By ROBERT NEWBERY.

4to. $15 00

*** The plates comprise examples from the Savage Tribes, Egyptian, Assyrian, Greek, Etruscan, Pompeian, Roman, Byzantine, Arabian and Saracenic, Persian, Turkish Indian, Hindoo, Chinese, Anglo-Saxon and Celtic, Medieval, Gothic, Renaissance, Italian and Conquicento, Elizabethan, and Louis Quatorze.

For Jewellers, Silversmiths, Workers in metals generally, for Gilt Frame Manufacturers, Fresco, and other ornamental Painters, for Decorators, Workers in Marble and Stone, for Architects, Builders, Carvers, and for Manufacturers of Silk, Cotton, and Woollen goods, and Paper Hangings, this superb volume is invaluable.

Nason.—Table of Reactions for Qualitative Chemical Analysis.

By HENRY B. NASON, Professor of Chemistry in the Rensselaer Polytechnic Institute, Troy, New York. Illustrated by Colors . . $0 63

Nicholson.—The Carpenter's New Guide.

A Complete Book of Lines for Carpenters and Joiners. By PETER NICHOLSON. The whole carefully and thoroughly revised by H. K. DAVIS, and containing numerous new and improved and original Designs for Roofs, Domes, etc. By SAMUEL SLOAN, Architect. Illustrated by 80 plates 4to. $4 50

Nicholson.—A Manual of the Art of Bookbinding:

Containing full instructions in the different Branches of Forwarding, Gilding, and Finishing. Also, the Art of Marbling Book-edges and Paper. By JAMES B. NICHOLSON. Illustrated. 12mo., cloth . . $2 25

Norris.—A Hand-book for Locomotive Engineers and Machinists:

Comprising the Proportions and Calculations for Constructing Locomotives; Manner of Setting Valves; Tables of Squares, Cubes, Areas, etc. etc. By SEPTIMUS NORRIS, Civil and Mechanical Engineer. New edition. Illustrated. 12mo., cloth $2 00

CONTENTS.—Areas of Circles; Diameters and Circumferences; Areas of Segments, and Zones of a Circle; Boiler of Locomotive; Elasticity of Cast and Wrought Iron; Conic Sections; Connecting Rods of Locomotives; Cylinders and Valves of Locomotives; Dimensions of Parts of Locomotives; Eccentric and Mode of Setting in Shaft; Eccentrics and Rods; Feed Pumps of Locomotives; Fractional Parts of an Inch; Frames of Locomotives; Friction; Resistance of Grades per Ton; Lever; Mechanical Powers; Mensuration of Solids; Mensuration of Surfaces; Miscellaneous Remarks; Proportions of Length of Circular Arcs; Proportions of Length of Semi-Elliptic Arcs; Radius of Curves; Railways; Reciprocals of Numbers; Resistance against the Piston; Revolutions of Driving-Wheels; Safety Valve and Lever; Safety Valves; Setting Valves; Shrinking of Tire Bars; Spring Steel; Squares; Cubes; Square Roots; Cube Roots; Steam Engine; Time of Running One Mile; Tractive Power of Locomotives; Tubes of Locomotives; Valve Motions; Weight of Materials; Weights and Measures; Wheels of Locomotives.

Nystrom.—On Technological Education and the Construction of Ships and Screw Propellers:

For Naval and Marine Engineers. By JOHN W. NYSTROM, late Acting Chief Engineer U. S. N. Second edition, revised with additional matter. Illustrated by seven engravings. 12mo. $1 50

O'Neill.—A Dictionary of Dyeing and Calico Printing:

Containing a brief account of all the Substances and Processes in use in the Art of Dyeing and Printing Textile Fabrics; with Practical Receipts and Scientific Information. By CHARLES O'NEILL, Analytical Chemist; Fellow of the Chemical Society of London; Member of the Literary and Philosophical Society of Manchester; Author of "Chemistry of Calico Printing and Dyeing." To which is added an Essay on Coal Tar Colors and their application to Dyeing and Calico Printing. By A. A. FESQUET, Chemist and Engineer. With an Appendix on Dyeing and Calico Printing, as shown at the Universal Exposition, Paris, 1867. In one volume 8vo., 491 pages $6 00

Overman.—The Moulder and Founder's Pocket Guide:

A Treatise on Moulding and Founding in Green-sand, Dry-sand, Loam, and Cement; the Moulding of Machine Frames, Mill-gear, Hollow-ware, Ornaments, Trinkets, Bells, and Statues; Description of Moulds for Iron, Bronze, Brass, and other Metals; Plaster of Paris, Sulphur, Wax, and other articles commonly used in Casting; the Construction of Melting Furnaces, the Melting and Founding of Metals; the Composition of Alloys and their Nature. With an Appendix containing Receipts for Alloys, Bronze, Varnishes and Colors for Castings; also, Tables on the Strength and other qualities of Cast Metals. By FREDERICK OVERMAN, Mining Engineer, Author of "The Manufacture of Iron." With Forty-two Illustrations. 12mo. $1 50

CONTENTS.—CHAPTER I. MOULDING.—*Materials for Moulding.* Sand—Green-sand—Dry-sand—Core-sand—Clay—Loam—Blackening—Coal-dust—Black-lead—Anthracite—Soapstone Powder—Localities of Materials—Grind-mills for Blackening. *Tools.* Flasks or Boxes—Crane—Small Tools, Trowels, Cleaner, Stamper, Shovels, Sieves—Pease-meal, Parting-sand, Gate-pins, Screws, &c. *Moulding in Green-sand.* Moulding of a Wheel—Filling in the Drag-box—the Top Box—Gits—Removing the Top Box—Drawing of the Pattern—Blackening the Mould—Pattern fastened to the Moulding-board—Composition of Moulding-sand—General Observations—Division of Labor. *Moulding in Open Sand.* Making of the Bed—Moulding in One Box—Moulding of a Cog-wheel—Causes of Failures—Moulding in more than Two Boxes—Small Articles of Machinery—Ornamental Moulding—Hollow-ware—Small Articles—Moulding of a Coffee-kettle—Patterns for Hollow-ware. *Mixed Moulding.* Moulding in Green-sand with Dried Cores—Cores and their use—Core-boxes—Moulding of a Column—Making a Pipe-Core—Moulding with Plates. *Dry-sand Moulding.* Drying of the Mould—Glands—Vertical Castings—Moulding of a Large Pipe—Loam Core—Hay Rope—Core-iron—Making of the Core—Casting Pipes without a Core—Small Ornamental Castings—Trinkets—Moulding a Stag—Screwing together of Ornaments—Soldering—Brass Castings—Fine Iron Castings. *Loam-moulding.* Quality of Loam—Compounding Loam—Moulding of Simple Round Forms *Moulding of a Soap-pan.* The Core—the Thickness—the Cope—Taking Apart the Mould—Blackwash—Gates—Gas-pipe—Cast-gate—Covering of the Flow-gate—Use of the Flow-gate—Casting by a Single Gate—Gas-pipes. *Moulding without Thickness.* A Steam Cylinder—Making of the Cope—the Steam-ways—Cores for the Steam-ways—Core for the Cylinder—Sullage Piece—Fastening of the Cores—Burying of the Mould—Fastening of the Exhaust-pipe Core—Use of Chaplets—General Remarks on Cylinder Moulding. *Irregular Forms.* Moulding of a Curved Pipe—Oval Forms—Bathing-tub—Elbow-pipe—Complicated Forms. *Moulding of Bronze Ornaments.* Moulding of Statues by the Ancient Greeks—French Mode of Moulding Statues—Present Mode of Casting Statues—Iron Statues—Bas-reliefs—Moulding of Bells. *Metal Moulds.* The Bore of Wheels—Railroad-car Wheels—Chilled Rollers—Casting together of Iron and Steel—Moulds for Tin, Lead, Pewter, Zinc, Types, &c.—Mould for Copper or Brass—Plaster of Paris Moulds—Stereotyping. *Impressions and Castings.* Wax, Crums of Bread, Sealing-wax—Sulphur—Glass—Clay, Artificial Wood—Plaster of Paris—Mould of a Coin—Mould of a Statue—Casting of Plaster—Taking of a Mask—Sulphur Castings—Wax Castings, Sealing-wax, and other Casts—Elastic Mould—Alum, Saltpetre, Moulding of Natural Objects. CHAP. II. MELTING OF METALS.—*Iron.* Qualities of Iron: No. 1 Iron, No. 2 Iron, No. 3 Iron—Characteristics of Foundry Pig—Mixing of Iron—Kind of Castings—Kind of Moulds—Melting of Iron—in the Blast Furnace—in Crucibles—in Reverberatories—the Cupola, description of—Operation in a Cupola—Pots—Blast Machines—Fans—Hot Blast—Drying Stoves. *General Remarks.* Cleansing of Castings—Time of Casting—Cost of Moulding and Casting—Melting of Bronze Metal—Melting of Lead, Tin, Antimony, and Brass.

APPENDIX.—RECEIPTS AND TABLES.—*Alloys of Iron.* Iron and Sulphur, Iron and Carbon, Iron and Phosphorus, Iron and Silicon, Iron and Arsenic, Iron and Chromium, Iron and Gold, Iron and Silver, Iron and Copper, Iron and Tin, Iron and Lead. *Alloys of Precious Metals—Alloys of Copper.* Bronze—Bell Metal—Bronze for Guns—Bronze for Statues—Bronze of the Ancient Greeks—Bronze of the Aztecs, Speculum

Metal, Speculum Metal of Rosse's Telescopes—Bronze for Medals, Bronze Imitation of Gold. *Brass.* Common Brass, Solder, Button-Brass, Red Brass, Princes' Metal, Brass and Lead, Tempering Brass—Brass for Ship Nails, Brass for Pens and Steps, Brass and Platinum—German Silver, Chinese Packfong, Argentan for Plating—Electron, Solder for German Silver, Copper and Platinum, Copper and Silver, Copper and Antimony—Copper and Carbon, Copper and Phosphorus, Copper and Arsenic. *Lead and its Alloys.* Lead and Arsenic, Lead and Antimony, Stereotype Metal, Fusible Metal. *Tin and its Alloys.* Tin and Lead, Pewter, Queen's Metal, Britannia Metal, German Tin, Music Metal, Antifriction Metal, Spurious Silver, Organ-Pipes—Imitation of Diamonds, Tin Foil *Zinc and its Alloys—Bronzing.* Natural Bronze, Antique Bronze—Various Colors—Bronze Paint—Gilding of Bronze and Brass—of Iron—Tinning of Brass, Bronze, and Copper—Zincking of Copper or Bronze—Glazing of Castings, Enamel—Blackening of Iron with Plumbago—with Varnish—Grinding and Polishing—Malleable Iron—Silvering of Iron—Tables, I.–IV.

Overman.—The Manufacture of Steel:

Containing the Practice and Principles of Working and Making Steel. A Handbook for Blacksmiths and Workers in Steel and Iron, Wagon Makers, Die Sinkers, Cutlers, and Manufacturers of Files and Hardware, of Steel and Iron, and for Men of Science and Art. By FREDERICK OVERMAN, Mining Engineer, Author of the "Manufacture of Iron," etc. A new, enlarged, and revised Edition. By A. A. FESQUET, Chemist and Engineer. $1 50

Osborn.—American Mines and Mining:

Theoretically and Practically Considered. By Prof. H. S. OSBORN. Illustrated by numerous engravings. 8vo. (*In preparation.*)

Osborn.—The Metallurgy of Iron and Steel:

Theoretical and Practical in all its Branches; with special reference to American Materials and Processes. By H. S. OSBORN, LL. D., Professor of Mining and Metallurgy in Lafayette College, Easton, Pennsylvania. Illustrated by numerous large folding plates and wood-engravings. 8vo.

$15 00

CONTENTS.—PART I. THEORETIC METALLURGY OF IRON. CHAPTER I. GENERAL PRINCIPLES OF THE CHEMISTRY OF IRON, Oxygen, Carbon, Hydrogen, Nitrogen, Ides and Acids, Sulphur, Phosphorus, Manganese, Chromium.

CHAP. II. THE ORES OF IRON; Commercial Ores of Iron; Magnetic Oxide of Iron; Magnetic Ore or Magnetite; Magnetic Mines and Ores; Titanic Iron Sand; Chrome Iron Sand; Geology; Franklinite; Geology; Red Hematite; Red Ore; Red Oxide; Anhydrous Sesquioxide of Iron; Specular Iron Ore; Geology; Localities; Brown Hematite; Brown Iron Ore; Hydrated Sesquioxide of Iron; Geology; Localities; Spathic Ore and Spathic Carbonate; Sparry Iron Ore; Sphærosiderite; Chalybite; Crystallized Carbonate of Protoxide of Iron; Geology; Fossil Ores; Localities; Geology; Analyses; Argillaceous Iron Ores; Clay or Clay-band Iron Stones; Black-band; Earthy Carbonates; Black-band; Localities; Analyses; Earthy Carbonate Ores and Calcareous Carbonate Ores; Impure Earthy Limestone Ores; Earthy Carbonates or Calcareous Carbonates; Localities; Bog Ores; Localities; Analyses; Peculiar Ores; Names and Localities; Review and Practical Remarks; *a*, Magnetic Oxide of Iron; *b*, Sparry Carbonate of Iron; *c*, Specular Iron Ore; *d*, Hydrated Oxide of Iron; *e*, the Compact

Earthy Carbonates; Argillaceous Ore of the Coal Formation; Mining of Iron Ore; Instruments or Tools; Exploring and Mining.

Chap. III. Special Properties of Iron and its Compounds: Crystalline System; Magnetism; Tenacity; Specific Heat; Dilation by Heat; Action of Heat; Welding; Crystalline and Fibrous Iron; Chemical and Special Effects of Combinations as Alloys; Iron and Oxygen; Protoxide of Iron; Sesquioxide of Iron, Anhydrous; Hydrated Sesquioxide of Iron; Sesquioxide of Iron and Lime; Magnetic Oxide of Iron; Iron Scale or Hammerslag; Ferric Acid; Iron and Water; Iron and Sulphur; Protosulphide of Iron; Sesquisulphide of Iron; Sulphides of Iron Roasted in the Air; the Protosulphide; Bisulphide; Iron and Nitrogen; Iron and Phosphorus; Manganese and Phosphorus; Iron and Arsenic; Case-hardening Iron or Steel by Arsenic; Silicon; Reduction of Silica by Carbon in the presence of Oxide of Iron and other Bases; Protoxide of Iron and Silica; Silicate of Protoxide of Iron reduced by Carbon; Iron and Carbon; Amount of Carbon in Iron; Experiments of Sefström; Modes of Existence of Carbon in Iron; the Chemical Combinations of Carbon; Action of Sulphur upon Iron containing Carbon; on the Action of Phosphorus on Iron containing Carbon and Sulphur; Spiegeleisen heated with Silica; Abstraction of Silicon from Cast Iron; Carbonate of Protoxide of Iron; Action of Sulphuric Acid or Hydrochloric Acid on Cast Irons; White Cast Iron; Gray Cast Iron; Action of Sea-water on Iron; Alloys of Iron, with Copper; with Zinc; with Copper and Zinc; with Tin; with Titanium; Method of determining Titanic Acid in Iron, with Lead, Antimony, Nickel, Silver, Gold, Platinum, Rhodium, Palladium, Aluminum, Chromium, Tungsten, Potassium, Calcium, Magnesium, Vanadium.

Chap. IV. Theory of Fluxes: General Principles and Introductory Practice; Tables of Proportions of Fluxes; Practical Experiments; Fluxes of the Blast Furnace; Practice with Fluxes; Laboratory Assays; Lime; Calcareous Spar; Oyster Shells; Analysis of Limestone; Clay; Silex; Varieties of Limestone and Lime; 1, Pure, Rich, or Fat Lime; 2, Hydraulic Limes; 3, Natural Cement; Artificial Cement; 4, Puzzolanas; Introductory to Dry Assay of Iron Ores; Assays with Charcoal; Assays with Fluxes; Fluxes for Assaying: Silica, Glass, Green Clay, Shale, Fire Clay, Good Blast Furnace Cinder, Borax Glass, Lime, Fluorspar or Fluoride of Calcium, Cryolite; the Main Object of Fluxes; the Quantity of Ore to be used; Choosing Samples; Proportion of Fluxes; Practical Directions for Assaying; Wet and Dry Methods; the Wet Assay; 1, by Volumetric Assay; by Bichromate of Potash; Permanganate of Potash Process; the Wet Assay; 2, by Chemical Analysis.

Chap. V. Fuel: Wood; Hard and Soft Wood, Ashes; Practical Remarks; Peat, Ashes; Chemical Analysis of Peat; Practical Remarks; Coal; Lignite or Brown; Brown; Bituminous; Anthracite; Brown Coal; Bituminous Coal; Pit Coal; Chemical Composition; Practical Remarks; Cubical Coal; Slate or Splint Coal; Cannel Coal; Glance Coal; Mining of Coal; Anthracite; Chemical Composition; Practical Remarks; General Remarks on Fuel; Tables of Weights and Density of Coals; Table of Composition of some of the Anthracite Coals of Pennsylvania; Charring of Wood; Charring in Heaps, Kilns; Charring in Mounds; Charring in Ovens; General Remarks; Charring of Peat or Turf; Charring of Brown Coal; Charring of Bituminous Coal, Coke; Charring in Heaps; Charring in Rows; Coking in Ovens; Pittsburg Coke Oven; English Coke Ovens; German Coke Oven; French Coke Oven; Coking in Iron Retorts; General Remarks on Coking; Table of the Amount of different kinds of American Coal; Heat liberated by Fuel; Analyses of Relative Value of Fuels; American Coal, and the Evaporative Power of American Fuel; Practical Remarks on the Analysis of Coals; Raw Coal, or Uncoked Bituminous Coal.

Part II. Practical Metallurgy of Iron. Chap. I. Roasting of Iron Ore: Magnetic Oxide of Iron; Hydrated Oxide of Iron; Brown Oxide, Hematite; Bog Ore; Sulphurets of Iron; Phosphurets of Iron; Arseniurets of Iron; Chlorine; Sulphates of Iron; Carbonates; Roasting of Iron Ore in Ovens or Furnaces; a Roast Oven; Roasting Mound; Ore Heap; Cleaning of Roasted Ores; Theory of Roasting Ores; Further Remarks on Modern Practice.

Chap. II. Reviving or Reduction of Iron; Direct Process: Malleable Iron from Magnetic Sand; Catalan Process; the Stückofen Furnace; Clay's Process; Chenot's Process; Yates' Process; Champlain Catalan Process; Ellershausen Process; another Method at Ringgold, Pa.

Chap. III. The Indirect Extraction of Iron as Cast Iron from the Ores: Stück or Wulf's Oven—Salamander Furnace; Blue Oven—Cast Oven; Blue Oven; Later Forms of Furnaces; Blast Furnace, Hartz Mountains, Germany; Blast Furnace in Silesia; Interior of a Blast Furnace for Bog Ore; Blast Furnace for Spathic Ore; Interior of Swedish Blast Furnace; German Blast Furnace; Cold Spring Blast Furnace; Pennsylvania Charcoal Blast Furnace; the Modern Charcoal Blast Furnace; Coke Furnaces; Coke Furnace, Great Western Iron Works, Pennsylvania; Coke Furnace,

Hyanges, France; Stonecoal Furnaces—Anthracite Furnaces; Antbracite Furnace, Reading, Pa.; Anthracite Furnace, Catasauqua, Pa.; Anthracite Furnace, Phœnixville, Pa.; Which Form is the Best for a Blast Furnace; Blast Furnace No. 2. Scranton, April, 1868; Furnace Glendon, above Easton, Pa., 1868; Stacks, Lehigh Crane Iron Works, Catasauqua, Pa., 1869; Stack No. I, Carbon Iron Co., Parryville, Pa.; Stack Lock Ridge Iron Co., Alburtis Station, near Allentown, Pa., 1868; Column Furnace at Saucon Iron Works, Hellertown, Pa.; Forms of Furnaces, Scranton, Pa., 1856, 1858, 1862, 1868; Dowlais Furnace, 1869; Remarks on the Construction of Furnaces in general; Furnace at Ebbw Vale, Monmouthshire, England; Higb Furnaces; Lurmann's Improvement.

CHAP. IV. BUILDING, BLOWING IN; PRACTICAL REMARKS UPON THE MANAGEMENT: the Building of a Blast Furnace; Blowing in a Furnace; Practical Remarks; the Management of Blast Furnaces.

CHAP. V. THEORY OF THE BLAST FURNACE: Table showing the Probable Consumption of Charcoal per 100 parts of Crude Iron witb Ores of Different Sorts; Analyses of Furnace Cinder.

CHAP. VI. PRACTICE OF CHARGES; MIXING OF ORES; CINDERS: Tables of Analyses of Slag, with Physical Appearance; Multiplying Fluxing Materials.

CHAP. VII. HOT BLAST OVENS: Theory of Hot Blast; General Remarks on Hot Blast; History of the Hot Blast, and Modern Applications and Improvements; Player's Hot Blast; the Apparatus; Russel's Hall Blast Oven; Further Remarks upon the Theory of the Hot Blast.

CHAP. VIII. GENERAL REMARKS UPON WASTE HEAT AND GAS: Waste Heat; Gas.

CHAP. IX. FIRE BRICK AND REFRACTORY STONES: Native Refractory Stones; Artificial Refractory Stones.

CHAP. X. BLAST MACHINES: Wooden Bellows of the Common Form; Wooden Cylinder Bellows; Iron Cylinder Blast Machine; General Remarks on Cylinder Blast Machines; Various Forms of Blast Machines; Fan Blast Machines; Receivers or Regulators of Blast; Alden's Blower; Dimpfel's Blower; Sturtevant's Blower; Mackenzie's Eccentric Blower; Blast Pipes; Tuyeres; Valves; Manometer; General Remarks on Blast Machines; Later Improvements.

CHAP. XI. HOISTS OR LIFTS.

PART III. CHAP. I. MANUFACTURE OF MALLEABLE IRON: Persian Mode of Making Iron; Catalan Forge; Bloomery Fire; German Forge; Forge Fire; Heating the Blast of a Forge Fire; Finery Fire; Puddling Furnaces; Puddling Furnace for Anthracite Coal; Single Puddling Furnace at Hyanges; Double Furnace with Water Bosbes; Brief Practical Notes and General Review and Remarks on the preceding.

CHAP. II. SOME PRACTICAL REMARKS UPON THE FURNACES: Puddling Furnace; Balling; Double Puddling Furnaces; Puddling witb Steam; Sbingling; Rolling; Shearing; Piling; Hammering; the Steam Hammer.

CHAP. III. LATE IMPROVEMENTS IN PUDDLING FURNACES: Siemen's Regenerative Gas Furnace; Wagner's Rolling Mill; Some Remarks on Charcoal Forges; General Remarks on Puddling; General Remarks on Refining; Theory of Refining and Puddling.

CHAP. IV. FORGING AND ROLLING: Forge Hammers; Squeezers; Roughing Rollers; Merchant Mill; Heavy Bar and Railroad Iron Rollers; Sheet Iron; Reheating Furnaces; Heating Ovens; Shears and Turning Machines; Tools; General Remarks.

PART IV. MANUFACTURE OF STEEL: Carburetted Steel by Direct Process from the Ore; Steel by Indirect Process; Steel of Cementation Bar or Blister Steel; Shear Steel; Cast Steel; Indian Steel or Wootz; on the Indian Methods of Working Iron and Steel for the Damascus Gun Barrels and Sword Blades; Damascus Sword Blades; Theldardin's Composition; Steel from Malleable Iron Melted; Mushet's Steel; American uses of Steel; Table of the Tensile Strength of Cast Steel Boiler Plates; Steel from Cast Iron Melted; Malleable Cast Iron; Decarbonization by Forced Air or Vapor; Process of J. Gilbert Martien; Bessemer's Process; Spiegeleisen for tbis Process; Bessemer Steel in Sweden; Heaton's Cast Steel Process; Chrome Iron Steel: Tenacity of Wrought Iron and Steel; Steel and Steely Iron; Remarks on the Bessemer Metal; Rolling Steel Rails; Steel Capped Rails; Weldless Steel Tyres; Analysis of Steel, etc. etc.

APPENDIX. Tables of Analyses of Iron and Steel, &c. &c.

Painter, Gilder, and Varnisher's Companion:

Containing Rules and Regulations in everything relating to the Arts of Painting, Gilding, Varnishing, Glass-Staining, Graining, Marbling, Sign-

Writing, Gilding on Glass, and Coach Painting and Varnishing; Tests for the Detection of Adulterations in Oils, Colors, etc.; and a Statement of the Diseases to which Painters are peculiarly liable, with the Simplest and Best Remedies. Sixteenth Edition. Revised, with an Appendix. Containing Colors and Coloring—Theoretical and Practical. Comprising descriptions of a great variety of Additional Pigments, their Qualities and Uses, to which are added, Dryers, and Modes and Operations of Painting, etc. Together with Chevreul's Principles of Harmony and Contrast of Colors. 12mo. Cloth $1 50

CONTENTS.—TOOLS AND APPARATUS: Taylor's Indigo Grinding Mill; Rawlinson's Indigo Grinding Mill.

COLORS.—WHITES: White Lead, Ceruse and Flake White; Spanish, or Bougival White; Gypsum, or Plaster of Paris; White of Troyes, or White Chalk. BLACKS: Ivory Black; Lampblack; Charcoal Blacks. REDS: Vermilion; Minium, or Red Lead; Carmine Lakes; Spanish Brown; other Reds. YELLOWS: Yellow Ochre; Massicot; Chrome Yellow; Turner's, or Patent Yellow; Orpiment; Naples Yellow; Yellow of Antimony; Yellow Pink. BLUES: Prussian Blue; Indigo; Ultramarine; Smalt, Zaffre, Azure, Saxon Blue, or Enamel Blue; Blue Verditer. GREENS: Verdigris; Italian or Verona Green; Saxon or Hungary Green; Scheele's Green; Schweinfurt Green; Brunswick Green; Green Verditer; Green Lake, or Venetian Green. BROWNS: Umber; New Brown, Discovered by Mr. Hatchet. COMPOUND COLORS, OR COLORS ARISING FROM MIXTURE: Light Gray, Buff, Silver or Pearl Gray, Flaxen Gray, Brick Color, Oak-wood Color, Walnut-tree Color, Jonquil, Lemon Yellow, Orange Color, Violet Color, Purple, Carnation, Gold Color, Olive Color, Lead Color, Chestnut Color, Light Timber Color, Flesh Color, Light Willow Green, Grass Green, Stone Color, Dark Lead Color, Fawn Color, Chocolate Color, Portland Stone Color, to Imitate Mahogany, to Imitate Wainscot, to Imitate Satin Wood.

OILS.—Oil of Spike; Oil of Lavender; Oil of Poppies; Nut Oil or Linseed Oil; Oil of Turpentine; Fat Oils; Drying Oils; Pilchard Oils.

VARNISHES.—Shell-lac Varnish; Turpentine Varnish; Linseed Oil Varnish; Copal Varnish; Gold-colored Copal Varnish; Camphorated Copal Varnish; Copal Varnish in Imitation of Tortoise Shell; Amber Varnish: Caoutchouc or Gum Elastic Varnish; Mastic Varnish; Varnish for Violins, etc.; White Hard Varnish; Varnishes for Paling and Coarse Wood Work; Varnish for Colored Drawings; Varnish for Glass; Black Varnish for Old Straw or Chip Hats; Varnish for Drawings and Card Work; Changing Varnishes; Mordant Varnishes. GENERAL OBSERVATIONS ON VARNISHES.

POLISHES.—Varnish Polish; Polish for Dark-colored Woods; Polish for Tunbridge Ware, Goods, etc.; Carvers' Polish; French Polish; Water-proof Polish; Finishing Polish.

GILDING MATERIALS.—Fine Gold Powder; Color-heightening Compositions; Mosaic Gold; Dutch or German Metal; Ethereal Solution of Gold; Gold Oil Color or Size; Gold Water Size; Preparatory Size; White Coating; Coloring Yellow; Vermeil.

MISCELLANEOUS MATERIALS.—Painter's Cream; Rotten Stone; Glue and Isinglass; Common Size.

GRINDING AND WASHING COLORS.

CLEANLINESS IN WORKING.

PRACTICE OF PAINTING.—Painting in Distemper; Painting in Milk.

PRACTICE OF VARNISHING AND POLISHING.—French Polish; Waxing.

PRACTICE OF GILDING.—Gilding Carved Wood with Water Size; Gilding Plaster or Marble with Water Size; Gilding Wood in Oil; to Gild Steel; to Gild Copper, Brass, etc.; Gilding Glass and Porcelain; Gilding Leather; Gilding Writings, Drawings, etc., on Paper or Parchment; Gilding the Edges of Paper.

ON LACQUERING.—Lacquer for Brass; Lacquer for Philosophical Instruments; Gold colored Lacquer for Brass Watch Cases, Watch Keys, etc.; to make Lacquer of Various Tints; to Clean Old Brass Work for Lacquering.

BRONZING.

JAPANNING.—Colors required in Japanning; to prepare a Tortoise Shell; Japan Ground by Means of Heat.

FOILS.—To Color Foils.

FISH-OIL COLORS.—To prepare the Oil; Gain by the above Process; Preparation and Cost of particular Colors; Subdued Green; Lead Color; Bright Green; Stone Color; Brown Red; Chocolate Color; Yellow; Black.

GLASS STAINING.—No. 1, Flux; No. 2, Gray Flux; No. 3, Flux for Carmines and Greens; the Various Colors.

BLUES.—Indigo Blue; Turquoise Blue; Azure Blue; Deep Azure Blue: Sky Blue for the Browns; Violet Blue for Ground Color; Lavender Blue for Ground Tint.

GREENS.—Emerald Green; Bluish Green; Grass Green; Dragon, Pistache, and Olive Green.

YELLOWS.—Sulphur Yellow; Fixed Yellow for Touches: Yellow for Browns and Greens; Deep Yellow to mix with the Chromium Greens; Jonquille; Yellow for Flowers; Wax Yellow; Fixed Wax Yellow; Nankin Yellow for Grounds; Deep Nankin Yellow; Pale Yellow Ochre; Deep Yellow Ochre, called Yellow Brown; Brown Yellow Ochre; Isabella Yellow for Grounds; Orange Yellow for Grounds; Brick Red; Deep Blood Red.

COLORS OF GOLD.—Hard Carmine; Pure Purple; Deep Violet.

COLORS OF IRON.—Flesh Red; Clove Brown; Wood Brown; Hair Brown; Liver Brown: Sepia Brown; White; Yellowish-Gray for Browns and Reds; Bluish Gray for Mixtures; Grayish-Black for Mixtures; Deep Black; Application of the Colors; to Fire the Paintings, Furnace, and Muffle.

HARMONY OF COLORS.

MISCELLANEOUS SUBJECTS AND USEFUL RECEIPTS.—To Increase the Strength of Common Rectified Spirits of Wine; to Silver by Heat; to Tin Copper and Brass; to Tin Iron and Copper Vessels; to Paint Sail Cloth so as to make it Pliable, Durable, and Water-proof; to make Oil Cloth; to prepare Varnished Silk; to Paint Cloth, Cambrio, Sarcenet, etc., so as to render them Transparent; to thicken Linen Cloths for Screens; Printer's Ink; Sticking or Court Plaster; to Imitate Tortoise Shell with Horn; a Varnish to Preserve Glass from the Rays of the Sun; to Imitate Rosewood; to Imitate Black Rosewood; a Fine Black Varnish for Coaches and Iron Work; a Varnish to Imitate the Chinese; to Clean Silver Furniture; to Color the Backs of Chimneys with Lead Ore; to Clean Marble, Sienna, Jasper, Porphyry, etc.; a White or Inside Painting; to take Ink Spots out of Mahogany; to make Paste for Furniture; to make Oil for Furniture, to Brown Gun Barrels; to Clean Pictures; Another Method; Varnish for Clock Faces, etc.; Varnish for Balloons.

DISEASES AND ACCIDENTS TO WHICH PAINTERS AND VARNISHERS ARE PARTICULARLY LIABLE.—Painter's Colic; Weakness of the Wrists; Effect of Poisonous Substances used in Painting and Varnishing; Nausea; Burns and Scalds.

GENERAL OBSERVATIONS.

DIRECTIONS FOR GRAINING AND IMITATING WOODS AND MARBLES.—Oak, Combs, Brushes, Colors, etc., Graining Color, Spirit Color. Pollard Oak, Root of Oak; to Grain Pollard and Root of Oak in Distemper; Walnut, Birdseye Maple in Distemper; to Grain Maple in Oil; Satin Wood; Mahogany in Distemper; Mahogany in Oil; Rosewood; Marble; Sienna; Black and Gold Marble; Saint Ann's; Verd Antique or Ancient Green; Egyptian Green; Rouge Roi or Royal Red; Italian Jasper; Dove Marble; Black Bardella; Derbyshire Spar; Granites; to Polish Imitation Marbles.

INSTRUCTIONS FOR SIGN WRITING.—Setting out or Arrangement of Letters; to Raise or make Letters Appear to Stand Out from the Board and to Shadow them; to Gild Letters; to Write, Gild, and Ornament on Glass.

COMPLETE INSTRUCTIONS FOR COACH PAINTING AND VARNISHING:—A suitable Place to Work in, Preparing the Oil, Boiled Oil, Raw Oil, Priming Coat for a Carriage Gearing and Body, Smoothing with Sandpaper, use of Pumice Stone in Smoothing after Priming, use of Grained Sole Leather in Smoothing after Priming, Rough Stuffing. Finishing up to receive the Color, Putting on the Color, Rubbing down after the second Coat, Varnishing, Ornamenting and Striping, Ornaments on Panel, Shading, Striping Varnishing after Striping.

APPENDIX.—COLORS AND COLORING; Theoretical and Practical: Comprising Descriptions of a Great Variety of Additional Pigments; Their Qualities and Uses; To which are added Dryers and Modes and Operations of Painting.

COLORS.—Qualities of Pigments.

OF WHITE AND ITS PIGMENTS. WHITE—White Lead, Adulterations; Krems, Crems, or Kremnitz White, Flake White, Blanc d'Argent, Roman White, Sulphate of Lead, Zinc White, Tin White, Pearl White, Tints.

Of the Primary Colors. Of Yellow—Jaune Minerale, Naples Yellow, Massicot, Yellow Ochre, Oxford Ochre, Stone Ochre, Roman Ochre, Brown Ochre, Terri di Sienna, Iron Yellow, King's Yellow, Chinese Yellow, Arsenic Yellow, Cadmium Yellow, Gamboge, Gall-stone, Yellow Lake. Of Red—Iodine Scarlet, Red Ochre, Indian Red, Light Red, Venetian Red, Rubric or Madder Lakes, Scarlet Lake, Lac Lake, Madder Carmine. Of Blue—Ultramarine, Factitious Ultramarine, Cobalt Blue, Smalt, Royal Blue, Antwerp Blue.

Of the Secondary Colors. Of Orange—Chrome Orange, Orange Ochre, Mars Orange, Burnt Sienna Earth, Orange Lead, Orange Orpiment. Of Green—Mixed Greens, Terre-verte, Chrome Greens, Cobalt Greens, Emerald Green, Mineral Green, Prussian Green, Invisible Green, Zinc Green. Of Purple—Mixed Purples, Gold Purple, Madder Purple, Burnt Carmine, Purple Lake, Purple Ochre.

Of the Tertiary Colors. Of Citrine—Mixed Citrine, Brown Pink, Umber. Of Russet—Mixed Russet, Field's Russet, Prussiate of Copper, Russet Ochre. Of Olive—Mixed Olive, Olive Green, Burnt Verdigris.

Of Semi-Neutral Colors. Of Brown—Vandyke Brown, Manganese Brown, Cappagh Brown, Burnt Umber, Cassel Earth, Cologne Earth, Rubens Brown, Brown Ochre, Bone Brown, Asphaltum, Antwerp Brown, Prussian Brown. Of Gray—Mixed Grays, Ultramarine Ashes, Phosphate of Iron, Plumbago. Of the Neutral. Black—Ivory Black, Lamp Black, Frankfort Black, Blue Black, Spanish Black, Mineral Black, Manganese Black, Black Ochre, Black Lead.

Tables of Pigments. Table I. Pigments which change by light, oxygen, and pure air, but not by shade, sulphuretted hydrogen, damp and foul air. Table II. Pigments little or not at all changed by light, oxygen, and pure air; but by shade, sulphuretted hydrogen, damp and impure air. Table III. Pigments changed by the action both of light and oxygen and the opposite powers of sulphuretted hydrogen, damp, and impure air. Table IV. Pigments not at all or little changed by the action of light, oxygen, and pure air; nor by the opposite influences of shade, sulphuretted hydrogen, damp and impure air; nor by the action of lead or iron. Table V. Pigments subject to change variously by the action of white lead and other pigments and preparations of that metal. Table VI. Pigments changed by iron, its pigments, and other ferruginous substances. Table VII. Pigments more or less transparent, and generally fit to be employed as graining and finishing colors. Table VIII. Pigments little or not at all affected by heat or fire. Table IX. Pigments little or not at all affected by lime, and eligible for fresco, distemper, and crayon painting. Dryers.

Modes and Operations of Painting—Grounds, Painting in Oil, Priming, Flattening, Stain Graining, Transparencies, Rules of Painting, Fresco, In Distemper Painting, Scagliola. Cleaning and Restoring—In Removing Varnish, Removing Paint.

Chevreul's Principles of Harmony and Contrast of Colors—Definitions, Analysis of Light and Color, The Source of Color, The Type or Standard of Color, On the Mixture of Colors, Colors of Objects, Complementary Colors, Circumstances which modify a Color. Modifications produced in a Color by being placed in contact with another Color. Result of placing Colors in Contiguity. First group—Two compound Colors, having the same simple Color in each. Second group—A compound color with a simple color which forms a part of the Compound. Third group—Two simple Colors. Fourth group—Two Compounds composed of the same simple Colors. Fifth group—A Compound Color, and a simple Color which is not found in the Compound. Influence of Gloss and of Form upon the Effect of Contrast of Two Colors. Binary associations of Colors.—1. Association of Complementary Colors.—2. Association of non-Complementary Colors. In the Association of two Colors of equal tone, the height of the tone may influence the Beauty of the Association. Influence of the Contiguity of White on Colors. Influence of the Contiguity of Black on Colors. Influence of the Contiguity of Gray on Colors. Harmony of Colors.—First group. Harmonies of Analogous Colors.—Second group. Harmonies of Contrast. On the Selection of the kind of Harmony for a given object. Index.

Pallett.—The Miller's, Millwright's, and Engineer's Guide.

By Henry Pallett. Illustrated. In one vol. 12mo. . . $3 00

Contents.—Explanation of Characters used; Definitions of Words used in this Work; United States Weights and Measures; Decimal Fractions; On the Selection of Mill-stones; On the Dressing of New Mill-stones—making their Faces Straight, and

ready for putting in the Furrows; Furrows: the Manner of Laying them out; their Draft, and cutting them in; Directions for laying off and cutting the Holes for the Balance Ryne and Driver; Directions for putting in the Balance Ryne and the Boxes for the Driver, and making them fast; Of Setting the Bed Stone, and Fastening the Bush therein; Directions how to Bridge or Tram the Spindle; Instructions for Grinding off the Lumps of New Stones; Turning the Back of the Running Stone; Rounding the Eye and Balancing the Stone; Directions for Dressing and Sharpening Mill-stones when they become dull; Respecting the Irons of the Mill; Description of Plate 4, Showing the Principle upon which the Mill-stones work; How to Fit a New Back on a Stone that has been running; Of the Elevator, Conveyor, and Hopper Boy; Of Bolting Reels and Cloths, with Directions for Bolting and Inspecting Flour; Directions for Cleaning Wheat; Instructions for Grinding Wheat; Directions for Grinding Wheat with Garlic amongst it, and for Dressing the Stones suitable thereto; Directions how to put the Stones in Order for Grinding Wheat that has Garlic amongst it; Directions for Grinding Middlings, and how to Prevent the Stones from Choking, so as to make the most of them; Reels for Bolting the Middlings; Instructions for a Small Mill, Grinding Different Kinds of Grain; Of the Manner of Packing Flour; Table showing the Number of Pounds which constitute a Bushel, as established by Law in the States therein named; The Duty of a Miller; Pearl Barley or Pot Barley; The Art of Distillation; Of the Importance of Draughting and Planning Mills; Cogs; the Best Time for Seasoning and Cutting them; The Framing of Mill-work; Windmills; A Table of the Velocity of Wind; Instructions for Baking; Receipts for making Babbitt Metal, etc.; Cement; Solders; Table Showing the Product of a Bushel of Wheat of different Weights and Qualities, as ascertained from Experiments in Grinding Parcels; Of Saw-mills and their Management; The Circular Saw; Rules for Calculating the Speed the Stones and other Pieces or Parts of the Machinery run at; To find the Quantity, in Bushels, a Hopper will contain; Table of Dry Measure; Spouts; the Necessity of making them Large; To lay off any Required Angle: Of Masonry; of Artificer's Work; Bricklayer's Work; Bricks and Lathes—Dimensions; Timber Measure; Table—Diameters in inches of Saw Logs reduced to inch board measure; Of the Wedge; Of Pumps: The Screw; Table showing the Power of Man or Horse as applied to Machinery; Measure of Solidity; Rules for calculating Liquids; A Table showing the Capacity of Cisterns, Wells, etc., in Ale Gallons and Hogsheads, in proportion to their Diameters and Depths; Steel—Of the various Degrees of Heat required in the Manufacture of Steel; Composition for Welding Cast Steel; Directions for Making and Sharpening Mill Picks; A Composition for Tempering Cast Steel Mill Picks; Governors for Flouring Mills; The Governor or Regulator; The Pulley; Of the Velocity of Wheels, Pulleys, Drums, etc.; On Friction; Belting Friction; Of the Strength of different Bodies; Falling Bodies; Of the different Gearings for propelling Machinery; The Crown or Face Gearing; On matching Wheels to make the Cogs wear even; On Steam and the Steam-engine; of Engines—their Management, etc.; Prevention of Incrustation in Steam Boilers; Double Engines; The Fly-wheel; Table of Circumferences and Areas of Circles, in Feet, suitable for Fly-wheels, etc.; To calculate the Effects of a Lever and Weight upon the Safety-valve of a Steam Boiler, etc.; Of the Slide Valve; Boilers; Chimneys; Explosion of Boilers; On the Construction of Mill-dams; Rock Dam; Frame Dams; Brush or Log Dam; Gates; Description of Water-wheels; Of Non-elasticity and Fluidity in Impinging Bodies; Motion of Overshot Wheels; The Breast Wheel; Overshot or Breast Wheels; Table of the Number of Inches of Water necessary to drive one Run of Stones, with all the requisite Machinery for Grist and Saw-mills, under heads of water from four to thirty feet; Table containing the Weight of Columns of Water, each one foot in length, and of various diameters; The Undershot Wheel; Tub Wheels; The Flutter Wheel; The Laws of Motion and Rest; Power of Gravity, Percussion, or Impulse, with the Reaction Attachment; Table of the Velocities of the Combination Reaction Water-wheel per minute, from heads of from four to thirty feet; Tables to reckon the Price of Wheat from Thirty Cents to Two Dollars per Bushel.

Perkins.—Gas and Ventilation.

Practical Treatise on Gas and Ventilation. With Special Relation to Illuminating, Heating, and Cooking by Gas. Including Scientific Helps to Engineer-students and others. With Illustrated Diagrams. By E. E. Perkins. 12mo., cloth $1 25

Perkins and Stowe.—A New Guide to the Sheet-iron and Boiler Plate Roller:

Containing a Series of Tables showing the Weight of Slabs and Piles to Produce Boiler Plates, and of the Weight of Piles and the Sizes of Bars to produce Sheet-iron; the Thickness of the Bar Gauge in decimals; the Weight per foot, and the Thickness on the Bar or Wire Guage of the fractional parts of an inch; the Weight per sheet, and the Thickness on the Wire Gauge of Sheet-iron of various dimensions to weigh 112 lbs. per bundle; and the conversion of Short Weight into Long Weight, and Long Weight into Short. Estimated and collected by G. H. PERKINS and J. G. STOWE. $2 50

Phillips and Darlington.—Records of Mining and Metallurgy;

Or Facts and Memoranda for the the use of the Mine Agent and Smelter. By J. ARTHUR PHILLIPS, Mining Engineer, Graduate of the Imperial School of Mines, France, etc., and JOHN DARLINGTON. Illustrated by numerous engravings. In one volume, 12mo. $2 00

CONTENTS.—Mining and Metallurgy; Historical Notice; Hydraulic Machinery; Steam Machinery; Steam Boilers; Superheated Steam; Crushing and Dressing Machinery; Assaying; Recent Metallurgic Processes; Boring; Mining as an investment; Joint Stock Companies' Act, 1856; Mining; Economics; Copper Ore Statistics; Miscellaneous Rules and Tables; Joint Stock Companies' Act of 1857.

Percy.—The Manufacture of Russian Sheet-Iron.

By JOHN PERCY, M.D., F.R.S., Lecturer on Metallurgy at the Royal School of Mines, and to The Advanced Class of Artillery Officers at the Royal Artillery Institution, Woolwich; Author of "Metallurgy." With Illustrations. 8vo. Paper . . . . . 50 cts.

Proteaux.—Practical Guide for the Manufacture of Paper and Boards.

By A. PROTEAUX, Civil Engineer, and Graduate of the School of Arts and Manufactures, and Director of Thiers' Paper Mill, Puy-de-Dôme. With additions, by L. S. LE NORMAND. Translated from the French, with Notes, by HORATIO PAINE, A. B., M. D. To which is added a Chapter on the Manufacture of Paper from Wood in the United States, by HENRY T. BROWN, of the "American Artisan." Illustrated by six plates, containing Drawings of Raw Materials, Machinery, Plans of Paper-Mills, etc. etc. 8vo. $10 00

Pyrotechny;

Or the Art of making Fireworks at little Cost, and with complete Safety and Cleanliness. With 124 illustrations of forms and diagrams for manufacture and exhibition. 12mo. $2 50

Roper.—A Catechism of High Pressure or Non-Condensing Steam-Engines:

Including the Modelling, Constructing, Running, and Management of Steam Engines and Steam Boilers. With Illustrations. By STEPHEN ROPER, Engineer. Full bound tucks $2 00

CONTENTS.—Introduction, The Steam-Engine, Water, Air, Heat, The Thermometer, Steam, The Engineer, The Steam-Boiler, The Safety-Valve, Feed-Water Heaters, Fuel, Chimneys, Smoke, Grate Bars, Duties of an Engineer in the Care and Management of the Steam-Boiler, Steam-Engines, Rules for the Care and Management of the Steam-Engine, Different Kinds of Engines, Knocking in Engines, Vacuum, The Indicator, The Governor, The Injector, Steam-Pumps, Centrifugal Pumps, Noiseless Boiler Feed-Pump, Piston-Rod Packing, Incrustation, Boiler Explosions, Steam and Fire Regulator, Central and Mechanical Forces, Mensuration, Belting, Rules to be Observed in case of Accidents, A Brief History of the Steam-Engine, Vocabulary.

Roper.—Hand-book of the Locomotive:

Including the construction, running, and management of Locomotive Engines and Boilers. With illustrations. By STEPHEN ROPER, Engineer. Full bound, tucks $2 50

Regnault.—Elements of Chemistry.

By M. V. REGNAULT. Translated from the French by T. FORRESTT BETTON, M. D., and edited, with Notes, by JAMES C. BOOTH, Melter and Refiner U. S. Mint, and WM. L. FABER, Metallurgist and Mining Engineer. Illustrated by nearly 700 wood engravings. Comprising nearly 1500 pages. In two volumes, 8vo., cloth $7 50

AMONG THE CONTENTS ARE—Volume I. :—French and English Weights, etc. Introduction—Crystallography; Chemical Nomenclature; Metalloids; Oxygen; Hydrogen; Selenium; Tellurium; Chlorine; Bromine; Iodine; Fluorine; Phosphorus; Arsenic; Boren; Silicum; Carbon; On the Equivalents of Metalloids. METALS.—Geology; Physical Properties of the Metals; Chemical Properties of the Metals. On Salts. I. ALKALINE METALS.—Potassium; Sodium; Lithium; Ammonia. II. ALKALINO-EARTHY METALS.—Barium; Strontium; Calcium; Magnesium. III. EARTHY METALS.—Aluminum; Glucinum; Zirconium; Thorinum; Yttrium; Erbium; Terbium; Cerium; Lanthanum; Didymium. CHEMICAL ARTS DEPENDENT ON THE PRECEDING BODIES.—Gunpowder; Lime and Mortar; Glass; Kinds of Glass; Imperfections and Alterations of Glass; Pottery, the Paste of which becomes Compact by Burning; Pottery, the Paste of which remains Porous after Burning; Ornaments and Painting; Chemical Analysis of Earthenware.

VOLUME II. :—Preparation of Ores, Manganese, Iron; Reduction in the Blast Furnace; Chromium; Cobalt; Nickel; Zinc; Cadmium; Tin; Titanium; Columbium; Niobium; Pelopium; Ilmenium; Lead, Metallurgy of; Bismuth, Metallurgy of; Antimony, Metallurgy of; Uranium; Tungsten; Molybdenum; Vanadium; Copper, Metallurgy of; Mercury, Metallurgy of; Silver, Metallurgy of; Gold; Metallurgy of; Platinum; Osmium; Iridium; Palladium; Rhodium; Ruthenium. IV. ORGANIC CHEMISTRY.—Introduction—Ultimate Analysis of Organic Substances; Construction of a Formula; Analysis of Gases; Essential Proximate Principles of Plants; Acids Existing in Plants; Organic Alkaloids; Neutral Substances in Plants; Nitrils; Essential Oils; Products of Dry Distillation; Fats; Organic Coloring Matters; Action of Plants on the Atmosphere; Animal Chemistry; Secretions; Excretions; Technical Organic Chemistry; Manufacture of Bread; Brewing; Cider and Perry; Wine-making; Beet Sugar; Cane Sugar; Sugar refining; Manufacture of Bone Black; Soap boiling; Principles of Dyeing; Mordants; Calico-printing; Tanning; Charring Wood and Coal; Manufacture of Illuminating Gas.

Riffault, Vergnaud, and Toussaint.—A Practical Treatise on the Manufacture of Colors for Painting:

Comprising the Origin, Definition, and Classification of Colors; the Treatment of the Raw Materials; the best Formulæ and the Newest Processes for the Preparation of every description of Pigment, and the Necessary Apparatus and Directions for its Use; Dryers; the Testing, Application, and Qualities of Paints, etc. etc. By MM. RIFFAULT, VERGNAUD, AND TOUSSAINT. Revised and Edited by M. F. MALEPEYRE. Translated from the French, by A. A. FESQUET, Chemist and Engineer. Illustrated by Eighty Engravings. In one vol., 8vo., 659 pages . . . $7 50

CONTENTS.—CHAPTER I. ORIGIN, DEFINITION, AND CLASSIFICATION OF COLORS.
CHAPTER II. MANUFACTURE OF COLORS.
SECTION I.—WHITE COLORS—Chalk Whites; White of Sulphate of Lime; Lead Whites; Processes—Holland, Thenard, Pattinson, Woolrich, Versepny, Wood, Mullins, Schutzenberger, Sewell, Crompton, Gannal, Rostaing; Mulhouse White Lead; Blanc d'Argent; Researches on the Purity of White Lead; Composition of White Lead; Measures necessary to render the Manufacture of White Lead less injurious to Health; Machines and Apparatus of Ward, Lefevre, Ozouf, Poelman; Precautions necessary; White of Chloride of Lead, of Sulphite of Lead, of Tungstate of Lead; Antimonite of Lead; Antimoniate of Lead; Whites of Antimony; White of Bobierre, Ruolz, and Rousseau; Whites of Vallée and Barreswil; White of Hallett and Stenhouse; Zinc Whites; Fabrication of Leclaire, of Murdoch, of Portillon; Snow White; Whites of St. Cyr and of Vitry; Various Colors obtained with Zinc White; Various Processes; Use of White of Zinc; Adulteration; Dangers and innocuousness; Use of Sulphide of Zinc; Whites of Barytes; Natural Sulphate; Artificial Sulphate.
SECTION II.—BLUE COLORS—Prussian Blue; Common Prussian Blue; Processes of Brunnquell, Karmrodt, and Schinz; Determination of the Value of the Product; Fabrication of Stephens; English Process for Manufacture of Prussian Blue; Bleu de Paris; Bleu de Monthiers; Test of the Richness of Prussian Blue; Blues of Antwerp, Thenard, Peligot, and of the Manganate of Lime; Indigo; Carmine Blue; Ultramarines; Natural Ultramarine; Artificial Ultramarine; Processes of Guimet, Gmelin, Tiremon, Weger, Pruckner, Winterfeld, Brunner, Dippel, Habich, and Gentele; Ultramarine Green; Ultramarine Blue; Process of Furstenau; Ultramarine White; Assay of Ultramarines; Composition; Ultramarine of Cobalt; Blue Ashes; Smalt; Cærulem; Tournesol (Litmus); English Sky Blue.
SECTION III.—YELLOW COLORS—Ochres; Ocre de Rue; Terre de Sienne; Venice Red; Jaunes de Mars; Curcuma; Stil-de-grain; Lacque de Gaude; Quercitron Lake; Chrome Yellows; Neutral Chromate of Lead; Basic Chromate of Lead; Jonquille Yellow; Cologne Yellow; Chromate of Lime; Chromate of Baryta; Chrome Yellow; Chrome Red; Chrome Green; Various Chromates; Chromate of Zinc; Chromate of Baryta; Red Sulphide of Antimony; Compound Colors; Lemon Yellow; Pale Yellow.
SECTION IV.—RED COLORS. Forty-eight Processes and Varieties of Colors.
SECTION V.—BROWN AND BLACK COLORS. Forty-two Processes and Varieties of Colors.
SECTION VI.—GREEN COLORS. Thirty-two Processes and Varieties of Colors.
CHAPTER III.—DESICCATION AND ADHERENCE OF COLORS—Drying Oils and various Siccative Materials; Benzoates of Cobalt and Manganese; Borate of Cobalt; Rosins; Borate of Manganese; Properties of Oil Paintings.
CHAPTER IV.—BRONZING.
APPENDIX.—Machinery for Grinding Colors.

Riffault, Vergnaud, and Toussaint.—A Practical Treatise on the Manufacture of Varnishes:

By MM. RIFFAULT, VERGNAUD, and TOUSSAINT. Revised and Edited by M. F. MALEPEYRE and Dr. EMIL WINCKLER. Illustrated. In one vol. 8vo. (In preparation.)

Reid.—A Practical Treatise on the Manufacture of Portland Cement:

By HENRY REID, C. E. To which is added a Translation of M. A. Lipowitz's Work, describing a New Method adopted in Germany for Manufacturing that Cement, by W. F. REID. Illustrated by plates and wood engravings. 8vo. $7 00

Robinson.—Explosions of Steam Boilers:

How they are Caused, and how they may be Prevented. By J. R. ROBINSON, Steam Engineer. 12mo. $1 25

CONTENTS.—Explosions caused by low water, by over-pressure, by defects in materials, &c.: by Scale or Sediment, by Repulsion of the water, by overheating of the water: How explosions caused by low water, by over-pressure, by defective materials, &c.: by Scale and Sediment, by repulsion of the water, by overheating of the water, may be prevented.

Roseleur.— Galvanoplastic Manipulations:

A Practical Guide for the Gold and Silver Electro-plater and the Galvanoplastic Operator. Translated from the French of ALFRED ROSELEUR, Chemist, Professor of the Galvanoplastic Art, Manufacturer of Chemicals, Gold and Silver Electro-plater. By A. A. FESQUET, Chemist and Engineer. Illustrated by over 127 Engravings on wood. 8vo., 495 pages . $6 00

☞ *This Treatise is the fullest and by far the best on this subject ever published in the United States.*

CONTENTS.—INTRODUCTION. PART I.—THIN ELECTRO-DEPOSITS. CHAPTER I. Object of the electro-plating art. II. Cleansing: Cleansing copper and its alloys, cleansing by fire or by alkalies, dipping, dipping in old aqua fortis, dipping in aqua fortis and soot, aqua fortis for a bright lustre, dipping in compound acids for a bright lustre, compound acids for a dead lustre, dipping in nitrate of binoxide of mercury. III. Cleansing silver IV. Scratch brushing: Various kinds of scratch brushes, lathe for scratch brushes. V. Bright lustre by mutual friction of small objects. VI. Varnish gold color. VII. Cleansing zinc, lead, tin, cast-iron, wrought iron, steel, &c. VIII. Galvanic batteries of Daniell, of Daniell with balloon, of Bunsen, of Bunsen modified, with bichromate of potassa, of Grove, with bisulphate of mercury, of Smee, of Smee modified, electro-magnetic apparatus, Pulvermacher's battery. IX. Copper deposits: by dipping, by battery. X. Brass deposits. XI. Tinning: electro-tinning, tinning by the method of double affinity, tinned cast-iron. XII. Gilding: Gilding by dipping, preparation of the gold baths for dipping. XIII. Sequel to gilding by dipping: ormoulu, colored golds, green and white gilding, gilding of silver by dipping. XIV. Sequel to gilding by dipping: gilding on porcelain, glass, or crystal. XV. Sequel to gilding by dipping: Gold bath with bicarbonates. XVI. Gilding by stirring and gold amalgam. XVII. Cold gilding by the rag. XVIII. Gilding with the brush or with shell gold. XIX. Galvano-gilding or gold electro-plating. XX. Gold-plating in hot baths: green gold, white gold, red gold, pink gold or new gold. XXI. Gilding watch parts and other small articles for watchmakers. XXII. Gilding thin wires. XXIII. Resists. XXIV. Gilding with a dead lustre: Gilding by fire or mercury; gilding with a partly dead, partly bright lustre. XXV. Gilding zinc with a dead lustre. XXVI. Dissolving gold from gilt articles. XXVII. Silvering: Plated silver, silvering with silver foil, whitening with silver in a pot, cold silvering by rubbing. XXVIII. Plated silver. XXIX. Silvering with silver foil. XXX. Whitening with silver in a pot. XXXI. Cold silvering by rubbing. XXXII. Sequel to silvering: by dipping in a warm—in a cold bath.

XXXIII. Silver electro-plating. XXXIV. Silver bath for "amateurs." XXXV. Argyrometry, or method by which the weight of deposited silver is directly ascertained. XXXVI. Argyrometric scale. XXXVII. Burnishing. XXXVIII. Dissolving silver from silvered articles. XXXIX. Resists. XL. Old silver: Oxidized silver, dark black. XLI. Niel, or nielled silver. XLII. Platinum deposits. XLIII. Electro-plating with nickel, zinc, steel, iron, antimony, bismuth, and lead; Colored (electro-chromic) rings. XLIV. Reduction of old baths: extraction of the gold, silver, platinum, and copper; ashes.

PART II.—GALVANOPLASTIC OPERATIONS PROPER. XLV. Object of the galvanoplastic art. XLVI. The bath. XLVII. Modes of operating: Deposits by separate batteries, simple apparatus, the same for the "amateur," large apparatus. XLVIII. Diaphragms or porous cells, keeping the batteries in order, amalgamating salt, acid baths. XLIX. Disposition of the pieces in the bath, galvano or electro-plastic deposits upon metals (with adherence). L. Dead lustre gilding by galvanoplastic deposit. LI. Galvanoplastic deposits upon metal (without adherence); galvanoplastic copies from Daguerreotypes. LII. Deposit upon non-metallic substances. LIII. Metallization: Plumbago, rendering moulds impervious to liquors, metallization of ceramic articles, metallic powders, metallization by the wet way. LIV. Moulding over the pattern: Moulding with plaster of Paris, stearine, wax, marine glue, fusible metal, gelatine, gutta percha. LV. Galvanoplastic deposits on moulds without delivery, and which are sacrificed: Lenoir's process; galvanoplastic method for articles in high relief with gutta percha moulds. LVI. Length of the operation. LVII. Removing the mould, finishing up the articles. LVIII. Galvanoplastic operations with gold or silver, gold and silver baths. LIX. Galvanic etching: Its future. LX. Bronzing: Bronze for medals, another receipt, bronze for zinc, green or antique bronze, black bronze, bronze powders or bronzines.

PART III.—CHEMICAL PRODUCTS AND APPARATUS EMPLOYED IN THE ART. LXI. Chemical Synonymy. LXII. Chemical products especially employed in the art: Acetate of copper, neutral (verdet); acetate of copper, basic (verdigris); acetate of lead (sugar of lead); subacetate of lead (extract of Saturn); acetic acid (vinegar); arsenious acid (arsenic acid, rat bane); Hyponitric acid (nitrous gas, nitrous vapors); nitric acid (aqua fortis); boric acid (boracic acid); hydrocyanic acid (prussic acid); hydrochloric acid (muriatic acid, spirit of salt); aqua regia (nitro-muriatic acid); hydrofluoric acid (fluoric acid); stearic acid (stearine); hydrosulphuric acid (sulphuretted hydrogen); sulphurous acid (sulphur gas); sulphuric acid (oil of vitriol); tannic acid (tannin); alloys; alloys of Darcet; copper alloys; amalgams; ammonia (nitride of hydrogen, ammoniacal gas, spirit of ammonia, volatile alkali, aqua ammonia); silver; nitrate of silver (lapis infernalis, lunar caustic); nitrate of peroxide of mercury (nitrate of mercury); nitrate of potassa (saltpetre); bicarbonate of potassa; bicarbonate of soda; binoxalate of potassa (sorrel salt); bitartrate of potassa (cream tartar, argol); borate of soda (borax); India-rubber (caoutchouc, gum-elastic); chloride of silver (horn silver); protochloride of tin (chloride of tin, muriate of tin, tin salt); chloride of gold (muriate of gold); chloride of platinum (muriate of platinum); chloride of zinc (muriate of zinc); cyanide of silver; cyanide of copper; cyanide of ammonium (hydrocyanate of ammonia); cyanide of calcium; cyanide of gold; cyanide of potassium (white prussiate of potassa); cyanide of potassium (pure for medicinal uses); cyanide of potassium (pure, cent. per cent., for the arts); cyanide of potassium (common, Liebig's process); ferrocyanide of potassium (yellow prussiate of potassa); cyanide of zinc; gelatine; benzole (benzine, light oil from tar); phosphate of ammonia; phosphate of soda, tribasic; pyrophosphate of soda, bibasic; plumbago (black lead); salts for amalgamating; sulphate of copper (blue vitriol, blue copperas); sulphate of iron (copperas, green vitriol); sulphate of mercury; sulphate of zinc (white vitriol, white copperas); sulphite of soda; sulphide of ammonium (hydrosulphate of ammonia); sulphides of calcium, potassium, and sodium (livers of sulphur); sulphide of carbon. LXIII. Instruments and apparatus daily employed in the art: stirring rods, electrodes, hydrometers (for acids and salts), glass balloons and flasks, kettles and boiling pans, brushes, burnishing tools, porcelain dishes, conducting wires or reophores, glass jars, retorts, crucibles, vessels and troughs for the baths, diaphragms—porous cells, filters, scratch brushes, syphons, thermometer. LXIV. Mixtures: Red or moulu, yellow or moulu, dead lustre for jewelry, dead lustre (hard) for clocks, dead lustre (soft) for plane surfaces and figures, green for red lustre, wax for gilding. LXI. Of general usefulness—antidotes and hygiene of the workshop: Poisoning by acids; poisoning by hydrocyanic (prussic) acid, cyanogen, and cyanides; poisoning by alkalies; poisoning by most metallic salts; poisoning by mercury salts; poisoning by lead salts; poisoning by hydrosulphuric acid (sulphuretted hydrogen); poisoning by chlorine, sulphurous and nitrous acids; hygiene of the workshop.

Schinz.—Researches on the Action of the Blast Furnace.

By Charles Schinz. Translated from the German with the special permission of the Author by William H. Maw and Moritz Müller. With an Appendix written by the Author expressly for this edition. Illustrated by seven plates, containing 28 figures. In one vol. 12mo. . $4 25

Sloan.—Homestead Architecture:

Containing Forty Designs for Villas, Cottages, and Farm-Houses, with Essays on Style, Construction, Landscape Gardening, Furniture, etc. etc. Illustrated by upwards of 200 engravings. By Samuel Sloan, Architect. 8vo. $4 50

Contents.—Drawings.—Selection of a Site, Remarks on Style, Hints on Construction. Designs. I. An Oriental Villa. II. An Italian Villa. III. A Farm House. IV. A Suburban Villa. V. A Picturesque Gothic Cottage. VI. A Bracketed American Cottage. VII. An Irregular Northern Villa. VIII. Modern Residence for a Physician. IX. A Small Villa in the Pointed Style. X. A Villa in the Italian Style. XI. A Cottage with Truncated Roof. XII. A Suburban Villa, No. 2. XIII. An Irregular Bracketed Country House. XIV. Small Decorated Gothic Villa. XV. A Cottage for a Mechanic or Clerk. XVI. Bracketed Village Residence. XVII. Plain Country House. XVIII. Model Bracketed Cottage. XIX. Plantation Residence. XX. Country House for any Climate. XXI. Country Residence in the Gothic Style, Warming and Ventilation. XXII. Suburban Residence. XXIII. Cottage in the Rural Gothic Style. XXIV., XXV. Plain Model Cottages. XXVI. Northern Cottage, Gothic Style. XXVII. A Lake or River Villa in the Italian Style. XXVIII. A Large Northern Farm House. XXIX. Country House, Gothic Style. XXX. An Irregular Country House. XXXI. An Anglo-French Villa. XXXII. Large Country House, Italian Style, Exterior Joinery. XXXIII. A Picturesque Villa. XXXIV. Anglo-French Villa, No. 2, Interior Finish, The Dumb Waiter. XXXV. Clustered Cottages. XXXVI. Small Bracketed Villa. XXXVII. Residence in German Gothic Style. XXXVIII. Symmetrical Cottage. XXXIX. Workingman's Model Cottage. Ground Plans.—A Double House, A Plain Farm, Dwelling, Carriage-House, and Stable, Embellishment of Grounds.

Appendix.—Terra-Cotta Furniture.

Sloan.—American Houses:

A variety of Original Designs for Rural Buildings. Illustrated by twenty-six colored Engravings, with Descriptive References. By Samuel Sloan, Architect, author of the "Model Architect," etc. etc. 8vo. . $2 50

Contents.—Design I. A Suburban Dwelling, elevation, and principal and second floors. II. An Italian Villa, elevation, and principal and second floors. III. Mansion, elevation, and principal and second floors. IV. A Southern Villa, elevation and principal floor. V. A Suburban Residence, elevation, and principal and second floors. VI. A River Villa, elevation, and principal and second floors. VII. An English Cottage, elevation, and principal and second floors. VIII. A Gothic Villa, elevation, and principal and second floors. IX. A Gothic Church, elevation and Plan. X. A Wayside Cottage, elevation, and principal and second floors. XI. Prairie Cottage, elevation, and gronnd plan XII. A Small Cottage, elevation, and ground plan. XIII. A Large Farm House, elevation, and principal and second floors. XIV. An Architectural Summer-House. XV. A Conservatory. XVI. Observatory, or Look-out.

Shaw.—Civil Architecture:

Being a Complete Theoretical and Practical System of Building, containing the Fundamental Principles of the Art. By EDWARD SHAW, Architect. To which is added a Treatise on Gothic Architecture, &c. By THOMAS W. SILLOWAY and GEORGE M. HARDING, Architects. The whole illustrated by One Hundred and Two quarto plates finely engraved on copper. Eleventh Edition. 4to. Cloth. $10.

CONTENTS.—INTRODUCTION—General Observations on the Construction of Houses; Doors; Windows; Mouldings; Volutes; Drawing a Column; Corinthian; Construction of Bridges; Wooden Bridges; Iron Bridges; Bridges in Boston; Western Avenue Bridge; Warren Bridge; Town's Improved Bridges; White's Tubular Suspension Bridge. PRACTICAL GEOMETRY—Definition of Lines and Points; Circles: Problems on Points and Lines; Trapeziums. CONIC SECTIONS—Definitions; Ellipses; Conjugates; to Describe Ellipses; The Parabola; Hyperbola; to Describe a Conic Section; Sections of Solids; of a Cylinder; Sections of a Cone; a Globe; a Spheroid; a Cycloid or Epicycloid; Section of Planes; Application of the Trihedral to Tangent Planes; Principles of Projection; Development of the Surfaces of Solids; Projections of Prisms. SHADOWS—Effect of Distance on the Color of Objects; Seat of the Sun's Rays; Upright Prisms; Polygonal Ring; Elevation of a Circular Ring; Lines of Light and Shade on a Sphere; Lines of Light and Shade from the Abacus of a Cylinder; Light and Shade on a Prism; Effect on Mouldings; Base and Capital; of a Cylindrical Recess; a Hemisphere. MOULDINGS—Roman Mouldings; Grecian and Roman Mouldings compared as to Form, etc.; Grecian Mouldings compared with the Roman of the same kind; The effect of Grecian Mouldings compared with Roman Mouldings of a different kind but in similar situations; Modern Mouldings; Grecian Mouldings; Architraves. THE ORDERS —Tuscan Order of Vitruvius; Modern Tuscan Order; Roman Doric; Example by Palladio; Example from the Baths of Diocletian; Roman Ionic; Corinthian; Example from the Temple of Jupiter Stator, Rome; Details of the same; Example from the Pantheon, Rome; Composite Order; Example from the Arch of Titus, Rome. PILASTERS—Arcades and Arches; Pedestals; Imposts and Bases; Balustrades. GRECIAN ORDERS—Definitions; Grecian Doric; Definitions; to Draw the Elevation of a Grecian Doric Order; Elevation of the Doric Order on the Temple of Minerva, at Athens, called the Parthenon; Details of the same; Elevation of the Doric Order on the Temple of Theseus, at Athens; Elevation of a Grecian Doric of a lighter proportion than any of the preceding, with the proportional measure in numbers; from the Choragic Monument of Thrasyllus; Grecian Ionic; the Ionic Temple; from the Ionic Temple on the Ilyssus; from the Temple of Minerva Polias at Priene, in Ionia; Details of the same; from the Temple of Bacchus, at Teos in Ionia; from the Temple of Minerva, at Athens; Grecian Architecture; Corinthian Order, Choragic Monument of Lysicrates; to Draw the Flutes of Columns; Bases; Entablatures; Designs for Cornices; Chimney-pieces; Doors; Modern Doors; Outside Doors; Ionic Front Door; Proportions of the Architraves and Pilasters for inside finish; Construction of Windows; French Window; Oriel Window; Details of the same; Foliage; to Draw the Ornament Leaves; Examples from the Arch of Adrian and the Monument of Lysicrates at Athens, and the Temple of Pola in Istria; Roses in the Capital of Columns; Various Examples in Rome and Tivoli; Ornaments for Mouldings; Various Examples in Rome. CARPENTRY—The Order of carrying on a Building; the Dimensions of the Timbers, their Distances and Places of Intersection; Floors; Partitions; Framing: the Scribe Rule; the Square Rule; Trusses; to Lighten the Girders; Plans of Floors; Roofs; Method of ascertaining the Length and Backing of Angle Rafters; Designs for Trussed Roofs; Designs for Framing Domes. STAIRS—To find the Helinet; the Formation of the Falling Mould; the Resting Points; Construction of the Face Mould; to find the Face Mould; Reciprocal Spiral and Scroll; Scholium; Formation of the Face and Falling Mould for the Scroll; Application of the Face Mould: Formation of the String. BRIDGES—Town's Bridge; Waterloo Bridge; RURAL VILLA; CHURCH EDIFICE. GOTHIC ARCHITECTURE—Florid English or Perpendicular Style; Manor House, South Wraxhall, Wilts; Details of Oriel Window; Merton College Chapel, Oxford; Eltham Palace, Kent. BUILDING—Mortar; Masonry; Formation of Stone Arches; Bricklaying; Plastering; Mastic Cement; Lathing; Plastering; Slating; Plumbing; Glazing; Painting. Tables showing Weight of different Materials, Strength of Columns, etc.; Glossary of Architectural Terms; Glossary of Technical Terms used in Masonry and in Building generally; Rules of Work.

Smith.—The Practical Dyer's Guide:

Comprising Practical Instructions in the Dyeing of Shot Cobourgs, Silk Striped Orleans, Colored Orleans from Black Warps, Ditto from White Warps, Colored Cobourgs from White Warps, Merinos, Yarns, Woollen Cloths, etc. Containing nearly 300 Receipts, to most of which a Dyed Pattern is annexed. Also, A Treatise on the Art of Padding. By DAVID SMITH. In one volume 8vo. Price $25 00

"Believing a work on Dyeing written by a Pattern-Dyer to be best calculated to impart sound information on the subject of Dyeing, I venture to bring my present work before the public; and to assure them that I have used every endeavor to make it as simple and as useful as it is possible to make a work of this description. In order to convey an idea of what the result would be, of dyeing pieces in a certain way, and with specified quantities of materials, I have annexed to each of the receipts (nearly 300) a DYED PATTERN OF WOOLLEN, WORSTED, AND MIXED GOODS, showing the color produced by the ingredients mentioned in the receipts. All these patterns have been dyed by my own hands, and with the very materials and quantities as stated in the receipts."—EXTRACT FROM THE PREFACE.

Smith.—The Dyer's Instructor:

Comprising Practical Instructions in the Art of Dyeing Silk, Cotton, Wool, and Worsted, and Woollen Goods: containing nearly 800 Receipts. To which is added a Treatise on the Art of Padding; and the Printing of Silk Warps, Skeins, and Handkerchiefs, and the various Mordants and Colors for the different styles of such work. By DAVID SMITH, Pattern Dyer. 12mo., cloth $3 00

CONTENTS.—Wool Dyeing, 60 receipts—Cotton Dyeing, 68—Silk Dyeing, 60—Woollen Yarn Dyeing, 59—Worsted Yarn Dyeing, 51—Woollen Dyeing, 52—Damask Dyeing, 40—Moreen Dyeing, 38—Two-Colored Damask Dyeing, 21—Camlet Dyeing, 23—Lasting Dyeing, 23—Shot Cobourg Dyeing, 18—Silk Striped Orleans, from Black, White, and Colored Warps, 23—Colored Orleans, from Black Warps, 15—Colored Orleans and Cobourgs, from White Warps, 27—Colored Merinos, 41—Woollen Shawl Dyeing, 15—Padding 42—Silk Warp, Skein, and Handkerchief Printing, 62.

Nature and Use of Dyewares, including Alum, Annotta, Archil, Ammonia, Argol, Super-Argol, Camwood, Catechu, Cochineal, Chrome, or Bichromate of Potash, Cudbear, Chemic or Sulphate of Indigo, French Berry or Persian Berry, Fustic or Young Fustic, Galls, Indigo, Kermas or Lac Dyes, Logwood, Madder, Nitric Acid or Aqua Fortis, Nitrates, Oxalic Tin, Peachwood, Prussiate of Potash, Quercitron Bark, Safflower, Saunders or Red Sandal, Sapan Wood, Sumach, Turmeric, Examination of Water by Tests, etc. etc.

Smith.—Parks and Pleasure Grounds;

Or Practical Notes on Country Residences, Villas, Public Parks, and Gardens. By CHARLES H. J. SMITH, Landscape Gardener and Garden Architect, etc. etc. 12mo. $2 25

CONTENTS.—CHAPTER I. The House and Offices. II. The Approach. III. Pleasure Grounds and Flower Gardens. IV. The Park. V. Ornamental Characters of Trees, detached and in Combination. VI. Planting. VII. Fences of the Park and Pleasure Ground. VIII. Water. IX. The Kitchen, Fruit and Forcing Gardens. X. Public Parks and Gardens. XI. The Villa. XII. General Observations on the Laying-out and Improvements of Grounds. XIII. The Arboretum. XIV. The Ponetum.

Shunk.—A Practical Treatise on Railway Curves and Location, for Young Engineers.

By WILLIAM F. SHUNK, Civil Engineer. 12mo. $2 00

Smeaton.—Builder's Pocket Companion:

Containing the Elements of Building, Surveying, and Architecture; with Practical Rules and Instructions connected with the subject. By A. C. SMEATON, Civil Engineer, etc. In one vol. 12mo. $1 50

CONTENTS.—INTRODUCTION.—THE BUILDER—BRICKLAYER—Bricks, Tiles, Brick-making, Cements, Lime, Sand, Mortar, Roman Cement, Puzzolana, Tarras, Methods of Bricklaying. THE CARPENTER—Oak, Fir, Larch, Beech, Ash, Elm, Chestnut, Walnut, Mahogany, Teak Wood, Poplar; Decay of Wood; Cause of the Decay; Circumstances favorable to Vegetable Decomposition; Means of Preventing Decay; Felling of Timber; Seasoning of Timber by Vacuum—by Water; Smoking and Charring; Boiling and Steaming; Ryan's Process; in Corrosive Sublimate; Framing of Timbers; Composition and Resolution of Forces; Construction of Roofs; Dimensions of Timbers in Roofs; Examples of Floors; Floors; Trusses; Connecting Timbers; Timber Partitions; Joints. THE JOINER—Woods; Glue; Gluing Joints; A very strong Glue; Different Methods of Joining; Dovetailing, Mortise, and Tenon; Grooving and Lapping; Binding and Gluing up; Scribing; Finishing of Joiner's Work; To make Glass or Sandpaper; Polish Wainscot and Mahogany. THE MASON—Different Kinds of Masonry; Method of Joining Stone; To clean or polish Marbles; Cements. THE PLASTERER—Coarse Stuff; Fine Stuff; Stucco for Inside Walls; Gauge Stuff; Bailey's Composition; Higgins's Patent Stucco; Parker's Cement; Hamelain's Cement; Maltha or Greek Mastic; Wyck's Stucco; Plaster to imitate Marble; Composition; Lime Wash; Plastering. THE PLUMBER—THE PAINTER—Materials; A Preparation for painting Ceilings; To whiten Internal Walls; To paint on Stucco; Graining; Colors; General Remarks. THE SMITH. PRACTICAL GEOMETRY. THE SURVEYOR—Mensuration of Superficies; Mensuration of Solids; Bricklayers' Work; Chimney; Tiling and Slating; Carpenter's and Joiner's Work; Mason's Work; Plasterer's Work; Painter's Work; Plumber's Work; Glazier's Work; Statements of Bricklayers', Carpenters', Joiners', Masons', Plasterers', Painters', Slaters', Glaziers', and Smiths', Work; Table of Cohesive Strength of Bodies; Specific Gravity and Weight of Wood THE ARCHITECT.

Stokes.—Cabinet-maker's and Upholsterer's Companion:

Comprising the Rudiments and Principles of Cabinet-making and Upholstery, with Familiar Instructions, illustrated by Examples for attaining a Proficiency in the Art of Drawing, as applicable to Cabinet-work; The Processes of Veneering, Inlaying, and Buhl-work; the Art of Dyeing and Staining Wood, Bone, Tortoise Shell, etc. Directions for Lackering, Japanning, and Varnishing; to make French Polish; to prepare the Best Glues, Cements, and Compositions, and a number of Receipts particularly useful for workmen generally. By J. STOKES. In one vol., 12mo. With Illustrations $1 25

Strength and other properties of Metals.

Reports of Experiments on the Strength and other Properties of Metals for Cannon. With a Description of the Machines for testing Metals, and of the Classification of Cannon in service. By Officers of the Ordnance Department U. S. Army. By authority of the Secretary of War. Illustrated by 25 large steel plates. In one vol. quarto . . $10 00

Sullivan.—Protection to Native Industry.

By Sir EDWARD SULLIVAN, Baronet, author of "Ten Chapters on Social Reforms." In one vol. 8vo. $1 50

This remarkable book, evincing as it does in the most unmistakable manner the reaction which has set in in England against British-free-trade, is well worthy the attention of all thoughtful Americans, and has already made a most decided mark in this country.

Smith.—A Manual of Political Economy.

By E. PESHINE SMITH. A new Edition, to which is added a full Index. 12mo. Cloth $1 25

This is one of that splendid series of treatises on THE POLITICAL ECONOMY OF THE AMERICAN SCHOOL which has during the past quarter of a century emanated from its great teachers—Carey, Colwell, Elder, Peshine Smith, and Wm. D. Kelley, and made an impression upon the people and woven a knowledge of real principles into the very texture of their modes of thought, to such an extent as will cause an earnest and living faith in them to be maintained throughout all time. That this system has *prepared and will ultimately complete the doom* of the fallacious one of Great Britain, the "Science based upon Assumptions," is as certain as any intellectual event in the future history of mankind.

The CONTENTS may be concisely given as follows:—

INTRODUCTION. CHAP. I. The Law of the Endless Circulation in Matter and Force. II. The Formation of Soils, and their Adaptation to Occupation and Culture. III. The Gratuitous Co-operation of the Natural Agents with Human Labor. IV. Rent. V. Wages. VI. Profits. VII. Exchanges. VIII. Money and Price. IX. Government. INDEX.

Stewart.—The American System.

Speeches on the Tariff Question, and on Internal Improvements, principally delivered in the House of Representatives of the United States. By ANDREW STEWART, late M. C. from Pennsylvania. With a Portrait, and a Biographical Sketch. In one vol. 8vo., 407 pages . . $3 00

Born in Fayette County, Penn'a, in 1791, and elected to Congress in 1820, Andrew Stewart—"Tariff Andy," as he was affectionately termed by the people of his State, and by the friends of protection generally throughout the country—faithfully and acceptably represented his district in the National Councils for eighteen out of the thirty years which immediately followed, and was during all that time recognized as being, with Mr. Clay, one of the two great champions of American industry in the country. The volume now published supplies an important chapter in the history of the contest so long carried on for the control of our markets by our own people and their foreign adversaries. The arguments are as applicable, as fresh, as convincing, and as instructive at this hour as they were on the days on which they were made.

No one can rise from the careful perusal of this volume without the feeling that it stamps its author as a man of the broadest, most comprehensive, and most statesman-like views and ideas. It is a subject of regret to those who can appreciate the weakness and blundering which characterized our national policy in 1850 and 1851, and the effects of that policy upon our subsequent history, that he was not nominated for Vice-President on the ticket with General Taylor, and did not become his successor in the Presidency, in 1850, instead of Mr. Fillmore.

Tables Showing the Weight of Round, Square, and Flat Bar Iron, Steel, etc.,

By Measurement. Cloth 63

Taylor.—Statistics of Coal:

Including Mineral Bituminous Substances employed in Arts and Manufactures; with their Geographical, Geological, and Commercial Distribution and Amount of Production and Consumption on the American Continent. With Incidental Statistics of the Iron Manufacture. By R. C. TAYLOR. Second edition, revised by S. S. HALDEMAN. Illustrated by five Maps and many wood engravings. 8vo., cloth . . . $10 00

Templeton.—The Practical Examinator on Steam and the Steam-Engine:

With Instructive References relative thereto, arranged for the Use of Engineers, Students, and others. By WM. TEMPLETON, Engineer. 12mo. $1 25

CONTENTS.—QUESTION 1. Engineer, what constitutes one. 2. Steam, what it is. 3. Steam an aqueous vapor. 4. Temperature, degrees of. 5. Thermometer, what it is. 6. Steam, high and low pressure. 7. Steam, superheated. 8. Steam a motive power. 9. Steam, inherent qualities of. 10. Steam, elasticity of. 11. Steam, elastic force of. 12. Steam, expansibility of. 13. Steam, properties of, by expansion. 14. Steam, latent heat of. 15. Steam from sea-water. 16. Sea-water, density of. 17. Steam from different waters. 18. Boilers, to prevent injurious effect of saturation on. 19. Refrigerator, what it is. 20. Refrigerator, to calculate. 21. Refrigerator, to estimate effects of. 22. Boilers, capacities of, &c. 23. Horse-power, nominal, to calculate. 24. Horse-power, steam quantity for. 25. Safety-valve, what it is. 26. Lever, action of, on safety-valve. 27. Safety-valve, how to calculate. 28. Safety-valve, area of. 29. Area of valve, how to calculate. 30. Area of valve in circular inches. 31. Area of valve, unit of. 32. Safety-valve affected by lever. 33. Safety-valves, two or more instead of one. 34. Steam-gauge. 35. Steam, indicated pressure of. 36. Barometer, what it is. 37. Vacuum, what it is. 38. Steam, condensation of. 39. Steam, quantity of water for condensation. 40. Water, relative quantities for condensation. 41. Condensation of elevated steam. 42. Steam-engine, duty and power of. 43. Steam-engine, expansive working of. 44. Steam-engine, mechanical effect of. 45. Steam, elastic force of, by expansion. 46. Steam cut off. 47. Steam cut off to effect expansion. 48. Steam-slide, or slide-valve. 49. Steam cut off by slide-valve. 50. Steam-slide, lap of. 51. Steam-slide, lead of. 52. Steam-slide, travel of. 53. Eccentric, what it is. 54. Eccentric, throw off. 55. Eccentric rod, to adjust. 56. Connecting rod, &c., to adjust. 57. Beam, side-levers, and so on. 58. Beam, versed sine to find. 59. Tenths, to reduce to eighths. 60. Parallel motion, to set. 61. Steam-engine, velocity of. 62. Steam-engine, effective power of. 63. Steam, uniform elastic force of. 64. Indicator, application of. 65. Indicator, diagram to take. 66. Indicator, diagram to calculate. 67. Indicator, force of steam by. 68. Steam and water, volumes of. 69. Feed-pump, to calculate. 70. Feed-pump, capacity of. 71. Condenser, temperature of. 72. Injection orifice, to clear. 73. Steam-vessel, speed of. 74. Fuel, proportions of. 75. Knots and miles distinguished. 76. Screw propeller, pitch of. 77. Screw propeller, slip of. 78. To find circle from curve. 79. Coals, evaporating powers of. 80. Combustion, what it is. 81. Effects of heat upon liquids. 82. Effects of cold upon liquids. 83. Effects of heat upon air, gases, &c. 84. Metals, conducting powers of. 85. Bodies, powers of retaining heat. 86. Radiation of heat. 87. Specific heat. 88. Effects of increased heat. 89. Safety-valve to load. 90. Equilibrium-valve, &c. 91. Relation between cube, sphere, &c. 92. Capacity and density of bodies. 93. Capacity of cylinders, &c. 94. Densities of irregular bodies. 95. Capacity of cisterns, to calculate. 96. Comparative weights of balls. 97. General laws of fluids. 98. Conical vessels, to calculate. 99. Tallow, to find amount of. 100. Oil, to find quantity of. 101. Paddle-shafts, to adjust. 102. Lubrication, what meant by. 103. Laws of friction, common. 104. Quantity of water

for condensation. 105. Cold water pump, to estimate. 106. Air pump, to estimate. 107. Weight of fly-wheel, to find. 108. Velocity of governors, to find. 109. Valves, how distinguished. 110. Nominal horse-power of engines. 111. Condensing and non-condensing engines. 112. Locomotive engines, to estimate. 113. Atmosphere, resistance of. 114. Inclined planes, effects of. 115. Speed of railway trains. 116. Meeting of railway trains. 117. Gravity, specific gravity, &c. 118. Pendulums, lengths to find. 119. Pendulums and gravitation. 120. Centre of oscillation. 121. Gravity on inclined planes. 122. Effects by circular motion. 123. Centrifugal and centripetal forces. 124. Centre of gyration. 125. Logarithms, what they are. 126. Mechanic powers, effects of. 127 Mechanic powers, distinguished. 128. Motion, what it is. 129. Motion, effects of. 130. Capillary attraction. 131. Metallic alloys.

TABLES —Temperatures and volumes of steam; Lap of slide-valve, to find; Mean elastic force of steam; Relative state of piston and exhaustion; Diameters of cylinders; Velocities of pistons; Decimal equivalents; Approximate numbers; Circumferences and areas of circles; Squares, cubes, square and cube roots of numbers; Hyperbolic logarithms; Natural sines, tangents, &c.; Expansion of air by heat; Barometer and thermometer; Specific gravities; Weights of bar and angle iron; Weights of plate and sheet iron; English standard measures; Gravity of water; Approximate weights of metals; Foreign lineal measures; Exchange of moneys; Distance of objects at sea; Temperature by thermometers; Strength of iron and copper plates; Values of foreign moneys.

Thomas.—The Modern Practice of Photography.

By R. W. THOMAS, F.C.S. 8vo., cloth 75

Thomson.—Freight Charges Calculator.

By ANDREW THOMSON, Freight Agent. 24mo. $1 25

This useful little volume comprises Tables for the Calculation of Freight at all prices per 100 lbs. *from one cent to one dollar.*

Turning: Specimens of Fancy Turning Executed on the Hand or Foot Lathe:

With Geometric, Oval, and Eccentric Chucks, and Elliptical Cutting Frame. By an Amateur. Illustrated by 30 exquisite Photographs. 4to. $3 00

Turner's (The) Companion:

Containing Instructions in Concentric, Elliptic, and Eccentric Turning: also various Plates of Chucks, Tools, and Instruments; and Directions for using the Eccentric Cutter, Drill, Vertical Cutter, and Circular Rest; with Patterns and Instructions for working them. A new edition in one vol. 12mo. $1 50

Urbin—Brull.—A Practical Guide for Puddling Iron and Steel.

By ED. URBIN, Engineer of Arts and Manufactures. A Prize Essay read before the Association of Engineers, Graduate of the School of Mines, of Liege, Belgium, at the Meeting of 1865-6. To which is added A COMPARISON OF THE RESISTING PROPERTIES OF IRON AND STEEL. By A. BRULL. Translated from the French by A. A. FESQUET, Chemist and Engineer. In one volume, 8vo. $1 00

Vaile.—Galvanized-Iron Cornice-Worker's Manual:

Containing Instructions in Laying out the Different Mitres, and Making Patterns for all kinds of Plain and Circular Work. Also, Tables of Weights, Areas and Circumferences of Circles, and other Matter calculated to Benefit the Trade. By CHARLES A. VAILE, Superintendent "Richmond Cornice Works," Richmond, Indiana Illustrated by Twenty-one Plates In one vol. 4to. $5 00

CONTENTS.—Preface; Geometry; Preliminary Chapter—Technicalities. PLATE I. Geometrical Problems. II. Right Angle Mitre Pattern. III. Mitre Pattern for a Perpendicular and Horizontal Moulding. IV. Raking or Pediment Mitre. V. Mitre Pattern for a Horizontal and Raking Moulding. VI. Mitre Pattern for a Horizontal and Circular Moulding. VII. Circular and Horizontal Mitre Pattern. VIII. Octagon, or any Irregular Horizontal Mitre Pattern. IX. Pattern for an Octagon Ball. X. To bring an Octagon Moulding upon a Square Base. XI. To find the Raking Moulding of a Pediment, and the Mitre Pattern for a Horizontal Return above and below. XII. To find the Mitre Pattern for the Intersection of two Raking Mouldings on Adjoining Faces of a Square Hexagonal or Octagonal Pinnacle. XIII. Same as XII, only on a Hexagonal Plan. XIV. To find the Stretch-out and Covering for the Scroll End of a Circular Moulding. XV. To find the Pattern for Gore to unite a Square Base with an Octagon Shaft, as Fig. 2. XVI. XVII. Circular Work. XVIII. XIX. XX. Circular Work. XXI. Setting a Cornice. Estimating. TABLE.—Showing the Comparative Weight and Measurement of Galvanized Sheet Iron; a figure having various sides, etc. TABLE.—Size and Number of Slates in a Square of 100 feet; Charcoal; Lineal Measure; Square Measure; Cubic Measure; Liquid Measure; Ale or Beer Measure; Dry Measure; To find the Quantity of Coal in a Wagon; Method for Measuring Cylindrical Vessels; To find the Contents of any Square Vessel; Properties of the Circle; To find the Area of a Circle; To find the Diameter of a Circle; To find the Area of a Cylinder; To find the Contents of a Pyramid or Cone; Russia Iron; To find the Circumference of an Oval; To find the Area of an Oval; To find the Area of a Sector of a Circle; To find the Area between two Circles having the same Diameter. TABLES.—To find the Area of Regular Polygons; Weight of Sheet Brass or Copper per Square Foot; Capacity of Tanks or Cisterns; Nails, sizes of; Weights of Lead Pipe; Weights of Pipes, etc.; Weight of Brass Tubing to the Foot; Fountains or Aqueduct Pipes; Weight of a Square Foot of Sheet Iron, Copper, and Brass; Weight of Wrought Iron, Steel, Copper and Brass Wire, and Plates; Size, Weight, Length, and Strength of Iron Wire; Sizes of Wire, expressed in Fractions of an Inch; Gold Lacquer; Red Spirit Lacquer; Pale Brass Lacquer; Iron-Work Black; Black Japan Varnish; Solder; How to apply Solder; Preserving Polished Steel from Rust; Bronzing Process for Brass; A Thin Shell of Metal; Babbit Metal; Coating Zinc. TABLE.—Weight of Wire to the Foot; Number of Yards and Feet to the Mile; Melting Points of Solids; Tempering; Copy of Bill of Day's Work of Plain Tin Ware.

Ville.—The School of Chemical Manures:

Or, Elementary Principles in the Use of Fertilizing Agents. From the French of M. GEO. VILLE, by A. A. FESQUET, Chemist and Engineer. With Illustrations. In one volume, 12mo $1 25

Extract from the Preface to the American Edition.

After the long controversies of the opposite schools of nitrogenized manures *versus* mineral ones, and conversely, it is refreshing to find that they may be agreed upon the common platform—that every plant needs nitrogen as well as mineral substances for its food. This important result, as well as the rational manner of determining the natural fertility of the soil and the dominant substances for the food of plants, has been demonstrated by Professor Geo. Ville after thirty years of comparative experiments conducted in the field and in the laboratory, and checking each other. Moreover, at the present time, several hundred farmers in Europe and in the colonies follow the advice of the learned professor of vegetable physiology, and by their correspondence confirm the truth of his teachings.

Chemical manures do not mean strange and unknown substances, new to the farmer; they simply include phosphorus, lime, potassa, and nitrogen, that is to say, the useful substances found in any serviceable manure, compost, etc., from time immemorial.

They are in a condensed form, nearly constant in composition, and may be readily mixed in various proportions to suit the nature of the desired crop, or the degree of the natural fertility of the soil. Moreover, with them, the farmer will he less exposed to frauds than when he buys manures already mixed, which, too often, are hut nondescript componnds.

Manuring with chemicals alone has been proved by Prof. Ville and his followers to be profitable; nevertheless, other manures and compounds may he used in connection with them, but their usefulness as plant food will be in the ratio of the phosphorus, lime, potassa, and nitrogen which they contain in the *soluble or available state.*

When once the farmer has arrived at a knowledge of the natural fertility of his farm by the aid of experimental fields, as explained in this work, he will he able to compound his manures for each desired crop, without expending money for what is already in the soil, or omitting what is wanting. How much more desirable to do so, and to work with certainty, than to buy already mixed manures from the manufacturer, who, supposing that he is honest, can certainly know little, if anything, about the natural fertility of the soil, the previous manuring, or the rotation of crops on the farm of the purchaser.

CONTENTS.—CHAPTER I. Formation and composition of plants; Fertility and sterility of soils; Farm-yard manure and chemical manure; Complete chemical manure. II. The particular action of each of the snbstances of the complete manure; The suppression of one of these subsances is sufficient to considerably diminish and even annihilate the power of the others. III. Aptitude of certain plants for extracting from the air the necessary nitrogen, which, therefore, may be dispensed with in the chemical manure; With these plants the mineral manure possesses as much efficacy as the complete manure. IV. Assimilability of manures in general. V. Each of the four constituent parts of the complete manure has in its turn a preponderating or subordinated action. VI. The hases for profit in agriculture; Manures are the raw materials of the crops; Yields obtained with an expense of 150 to 200 francs of chemical manure per hectare.

APPENDIX. Ploughing and preparing the soil; Methods of using chemical manures. FORMULÆ OF MANURES: Wheat, barley, oats, rye, natural pastures, hemp, rape-seed (colza), beets, carrots, cahhages, hops, gardening, potatoes, grape-vines and small trees, turnips, rutahagas, Jerusalem artichokes, sorgho, sugar-cane, maize, heans, horse-beans, peas, clover, sainfoin, vetches, lucern. ROTATION OF CROPS. FIRST CASE. The chemical manures are employed alone, without admixture of stahle manure; Exclusive culture of wheat; Alternate culture of rape-seed (colza) and wheat; Rotation of four years, comprising: potatoes, wheat, clover, wheat; Rotation of four years, comprising: beets, wheat, clover, wheat; Rotation of five years, comprising: potatoes, wheat, clover, colza, wheat; Rotation of two years, comprising: maize, wheat; Rotation of six years, comprising: flax, beets, wheat, colza, wheat and oats, rye or harley; Rotation with fodder plants; Manures for pasture (forages). SECOND CASE. The chemical manures employed as auxiliary to farm-yard manure; Rotation comprising: potatoes, wheat, clover, wheat, oats; Rotation, comprising: heets, wheat, clover, wheat, oats; Rotation comprising: colza, beets, wheat, clover, wheat; Rotation of six years, comprising: flax, heets, wheat, colza, wheat and oats, rye or barley; Experimental fields; Experimental field for a primary school; Culture of wheat; Composition of the manure intended for the experimental fields of a primary school; Experimental field for the analysis of the soil; Series for wheat; Series for heets. VOCABULARY OF CHEMICAL MANURES. Nitrogenized subsances; Sulphate of ammonia; Nitrate of soda; Nitrate of potassa; Phosphate of lime; Sulphate of lime.

Vogdes.—The Architect's and Builder's Pocket Companion and Price Book:

Consisting of a Short but Comprehensive Epitome of Decimals, Duodecimals, Geometry, and Mensuration; with Tables of U. S. Measures, Sizes, Weights, Strengths, etc., of Iron, Wood, Stone, and various other Materials, Quantities of Materials in Given Sizes, and Dimensions of Wood, Brick, and Stone; and a full and complete Bill of Prices for Carpenter's Work; also, Rules for Computing and Valuing Brick and Brick Work, Stone Work, Painting, Plastering, etc. By FRANK W. VOGDES, Architect. Illustrated. Full bound in pocket-book form . . $2 00
Bound in cloth 1 50

CONTENTS.—Explanation of Arithmetical Signs and Characters in general use to denote and abbreviate the several Mathematical Operations; Decimal Fractions: Addition and Subtraction, Multiplication, Division, to reduce a Vulgar Fraction to a Decimal; Duodecimals; Involution and Evolution; Synopsis of Practical Geometry—definition of terms and figures, Circles; Mensuration of Superfices; Table of the Angles of Polygons; Mensuration of Irregular Bodies; Table of the Relative Proportions of the Circle, of its equal Squares, etc.; Problem to find the Approximate Ratio of the Circumference to the Diameter of a Circle; Tables, showing the Diameter, Circumference, Area, and Side of equal Squares of Circles, from 1 to 50: Arcs and Segments of Circles, Ellipses, Zones, etc.; Of Solids; Table of the Surfaces and Solidities of each of the regular bodies when the linear edge is one, or Unity; United States Weights and Measures; Miscellaneous Measures and Weights; Table of Dimensions of various Measures of Capacity; Table of Decimal Parts of a Pound; Sizes of Drawing Paper; Table, showing the Decimal Value of the divisions of a Foot, viz, inches and parts of inches; Table of some of the Vulgar Fractions in general use, reduced to their Decimal Equivalents; Table, showing the rise per foot of grades from 1 degree to 45 degrees, from 1 foot to 100 feet—in feet, inches, tenths of inches; Strength of Materials; Table of the cohesive Force of Metals, etc.; Strength of Alloys when pulled in the direction of their length; Woods; Miscellaneous Substances; Stone, etc., the force necessary to crush one cubic inch; Table of Cubes of one-fourth of an inch; Table of the Strength, Extensibility, and Stiffness of Woods and Metals, Cast-Iron being 1, or Unity; Cohesive Strength of Materials; Table of the Cross or Transverse Strain of different kinds of Woods, each piece being one foot long, one inch broad, and one inch deep; Table of Cast-Iron Joists, for fire-proof floors, where the load is not greater than one hundred and twenty pounds to a superficial foot; Table, showing the Weight or Pressure a beam of Cast-Iron, one inch thick, will sustain, without destroying its elastic force, when it is supported at the ends, and loaded in the middle of its length; Table of the Strength of Cast-Iron Beams, continued; Tables of Sizes and Weights of Rolled Iron Beams, etc.: Solid Wrought Iron Beams, Deck Beams, Compound and Lattice Girders, Channel Bars, Chord Bars, T Bars, Angles—even legs, Angles—uneven legs; Sash, Purlin, and Spoke Iron, Strength and Stiffness of Beams and Girders, Formulæ, Table of Reference; Table of the Depth of Square Beams or Bars of Cast-Iron, calculated to support from one cwt. to fourteen tons, in the middle, the Deflection not to exceed one-fortieth of an inch, for each foot in length; Table of practical formulæ, by which to determine the Amount of Weight a Column of given dimensions will support in lbs.; Table to show the weight or pressure a Column of Cast-Iron will sustain with safety; Strength of Materials of Construction; Cast-Iron Columns: Table, showing the Diameter of a solid column or cylinder of Cast-Iron required, according to its length or height, to support a given extent of Flooring, etc., or a given Weight; Cast-Iron Columns: Table, showing approximately the Diameter and Thickness-of Metal of Hollow Columns of Cast-Iron which will support given weights, and given extent of Flooring, etc.; Relative Weights of Metals; Iron: Weight of Square Rolled Iron; Table of the Weight of a Square Foot of Sheet Iron in lbs., Avoirdupois, the thickness being the number on the Birmingham Wire Gauge; Table of the Weight of a Superficial Foot of various Metals in lbs.; Table, exhibiting the Weight of a Lineal Foot of Round Rolled Iron, from ¼ to 12 inches diameter; Table, exhibiting the Weight of a Lineal Foot of Flat or Bar Iron, in lbs., from ½ to 5½ inches in Breadth, and ¼ to 5 inches in Thickness; Weight of a Lineal Foot of Cast-Iron Pipes, from 1 inch to 30 inches bore; Weight of a Lineal Foot of Riveted Copper Pipes; Table, showing the Weight of a Lineal Foot of Copper Pipes; Weight of a Lineal Foot of Copper Rods or Bolts; Value in Inches of the Birmingham Gauge for Wire, etc.; Table, showing the comparative Weight and Measurement per square foot of Sheet Iron as at present made by the American Manufacturers; Weight per Square Foot of Cast and Wrought Iron, Copper, and Lead, from 1-16 to 2 inches thick; Table of the Weight, in lbs., of a foot in length of Cast-Iron; Table, showing the Weight of Solid Cylinders of Cast-Iron, 12 inches long, etc.; Rods, Nuts, and Washers; Expansion of Metals; Table, showing the number of Nails and Spikes to a pound; Table of the Weight of Lead Pipe per yard; very light Pipe; Table, showing the Capacity and Weight of Cast-Iron and Lead Balls, from 1 inch to 8½ inches diameter; Table exhibiting the Number of Threads to an inch in V-thread Screws; Table of Sizes of Nuts, equal in strength to their Bolts; Copper. Weight of a Lineal Foot of Round and Square; Brass: Weight of a Lineal Foot of Round and Square; Weight of one foot of Square Steel, from ¼ inch up to 2 inches; Weight of one foot of Round Steel, from ¼ inch up to 2 inches in diameter; Weight of one foot of Flat Steel; Weight of Sheet Zinc to the Square Foot; Weight of a Square Foot of Cast and Wrought Iron, Copper, Lead, and Brass; Weight of a Square Foot of Sheet Iron, Copper, and Brass; Weight of one foot in length of Hoop Iron; Water Pipes for Hydrants, Pumps, etc., Waste Pipe, Block Tin Pipe, Mineral Water Pipe,

Sheet Lead, Patent Lead Encased Block Tin Pipe, Pure Block Tin Pipe, Sheet Block Tin; Weight of Water at its Common Temperature; Table, showing the Capacity of Cisterns, Wells, etc., in U. S. Ale Gallons and Hogsheads, in proportion to their Diameters and Depths; Angles of Equilibrium at which various substances stand, as taken with a Clinometer; Absorption of Moisture by various Building Materials; Table of the Diameter and Length of Gas Pipes to transmit given quantities of Gas to Branch Pipes and Burners; Table of the Capacity of Wells, Cisterns, etc.; Round Wire Ropes, for Inclined Planes, Mines, Collieries, etc.; Flat Wire Ropes for Pits, etc.; Size and Strain of Copper Window Sash Lines; Table of Data, etc., useful in various Calculations, arranged alphabetically; A Short Dictionary of the Technical Terms most frequently used by Architects and Artificers; Carpenters' Work; Bill of Prices for Carpenters' Work: Iron Work; Antæ and Square Columns; Architraves and Casings; Ashlans; Barge Boards; Base or Washboards; Balustrades; Bond Timber; Boxing for Inside Shutters; Batten Doors and Shutters; Blocks and Plugs in Walls; Blinds; Bracketing for Ceilings and Stucco Cornices; Brackets or Consoles for Cornices, Counters, etc.; Brick Mortices; Bridging Joist; Board Partitions; Capping Walls; Carpet Sills; Cisterns, Reservoirs, and Tubs; Ceiling, Wainscoting, or Siding; Frames for Cellar Windows, Doors, or Doorways; Centres for Vaults or Arches; Cloak Rails; Columns; Cornices and Entablatures; Counters; Door Frames; Dormer Windows; Drawers; Facia; Fencing: Palisade Fences; Balustrade Fences; Flooring; Counter Ceiling or Deafening; Framing of Timber—Girders—Trimmers; Trussed Girders and Roof Trusses; Mortices and Tenons; Coved or Groined Ceilings and Domes; Towers and Steeples; Framed Houses; Joist; Roofs; Plates; Sheeting Roofs; Stud Partitions; Grounds; Imposts; Inside Shutters; Jambs; Hardware; Lattice Work and Summer Houses or Arbors; Lintels; Mantels; Mouldings; Panel Doors and Shutters; Panel Work; Pews; Pilasters; Plinths; Porches; Privies; Sash, scale of prices per light; Sheeting and Shingling; Show Windows; Sky Lights and Trap Doors; Surbase or Sub-base; Shelving; Stairs: Step Ladders; Warehouse Stairs; Stairs between Walls; Open Stairs; Stables; Weather-boarding; Window Frames; Tables of Boards, Planks, Joists, Rafters, Posts, Furring, etc., reduced to Board Measure; Table, showing the number of Feet Lineal of Scantlings of various sizes, equal to one cubic foot; Table, showing the number of cubic feet of Wood contained in one Ton weight; Table, showing the amount of Timber in one Load; Brick Work; Table of number of Bricks in Walls of different thicknesses; Application of the foregoing Table; Diagrams of Brick Foundations for Brick Walls, with number of Bricks required per foot lineal for each; Bricklayer's Memoranda; Quantity of Brickwork in Barrel Drains and Wells; Excavator and Well-digger's Memoranda; Rubble Masonry; Table of the number of Perches and Cubic Feet of Stone in Walls; Application of the foregoing Table; Dimensions for Arch Culverts; Slater's Notes and Memoranda; Sizes of American Slates, and number of pieces required per square; Painting and Glazing; List of Prices, House Painting and Furnishing Paints; Prices of Glazing; Prices of Re-glazing; Sign and Ornamental Painting; Projecting Wood Letters; Tin Signs; Window Glass, Lights per box; Plastering and Stucco Work; Tin and Tin Work; Table, showing the Lengths and Diameters of Pipes made from single Sheets, and also amount contained in boxes; Semicircular Gutters; Contracts for Workmanship and Materials; Article of Agreement; American Institute of Architects, New York—Schedule of Charges; Professional Practice and Charges of Architects, confirmed by the Royal Institute of British Architects; Index.

Watson.—The Modern Practice of American Machinists and Engineers:

Including the Construction, Application, and Use of Drills, Lathe Tools, Cutters for Boring Cylinders, and Hollow work Generally, with the most Economical Speed for the same; the Results verified by Actual Practice at the Lathe, the Vice, and on the Floor. Together with Workshop Management, Economy of Manufacture, the Steam-Engine, Boilers, Gears, Belting, etc. etc. By EGBERT P. WATSON, late of the "Scientific American." Illustrated by eighty-six engravings. In one volume 12mo. $2 50

CONTENTS.—PART I.—CHAPTER I. The Drill and its Office. II. The Drill and its Office—continued. III. The Drill and its Office—continued.

PART II.—LATHE WORK. IV. Speed of Cutting Tools. V. Chucking Work in

Lathes. VI. Boring Tools. VII. Boring Tools—continued; Abuses of Chucks. VIII. Boring Steel Cylinders and Hollow Work; Experiments with Tools needed; Conservatism among Mechanics. IX. Turning Tools. X. Turning Tools—continued. XI. Turning Tools—continued. XII. Turning Tools—continued. XIII. Turning Tools—continued.

PART III.—MISCELLANEOUS TOOLS AND PROCESSES. XIV. Learn to Forge your own Tools; Manual Dexterity; Spare the Centres. XV. Rough Forgings. XVI. How to use Callipers. XVII. A Handy Tool; Rimmers. XVIII. Keying Wheels and Shafts. XIX. Taps and their Construction; Tapping Holes; Abuse of Files. XX. Defective Iron Castings; "Burning" Iron Castings; How to shrink Collars on a Shaft. XXI. Are Scraped Surfaces indispensable? Oil Cups; Drilling and Turning Glass. XXII. Manipulation of Metals.

PART IV.—STEAM AND THE STEAM-ENGINE. XXIII. The Science of Steam Engineering. XXIV. Piston Speed of Steam-Engines. How to set a Slide Valve; To find the Length of the Rod; An improperly set Valve; Lead; The Lead Indicator. XXVI. Defect in Steam-Engines. XXVII. The Slide Valve; Balanced Slide Valves. XXVIII. Connection of Slide Valves; The Pressure on a Slide Valve. XXIX. Condensation of Steam in long Pipes. XXX. Packing Steam Piston. XXXI. Pistons without Packing. XXXII. Bearing Surfaces. XXXIII. Lubricating the Steam-Engine. XXXIV. Derangement of Steam-Engines. XXXV. Cold Weather and Steam-Engines; Oil entering a Steam Cylinder against Pressure. XXXVI. Explosions of Steam Boilers; Boiler Explosions; Is your Boiler safe? Faulty Construction of Steam Boilers; Troubles Incident to Steam Boilers; Starting Fires under Boilers; Steam Boilers and Electricity; Field for Improvement in Steam Boilers. XXXVII. Location of Steam Gauges and Indicators; The Laws of Expansion.

PART V.—GEARS, BELTING, AND MISCELLANEOUS PRACTICAL INFORMATION. XXXVIII. Relating to Gears. XXXIX. Leather Bands; Belting. XL. Cone Pulleys for given Velocities; Formulæ for Cutting Screw Threads. XLI. How to lay up an Eight Strand Casket; To Turn an Elbow; Fly-wheels for Long Shafting; Velocity of Mechanism. XLII. Various useful Items.

Watson.—A Manual of the Hand-Lathe:

Comprising Concise Directions for working Metals of all kinds, Ivory, Bone and Precious Woods; Dyeing, Coloring, and French Polishing; Inlaying by Veneers, and various methods practised to produce Elaborate work with Dispatch, and at Small Expense. By EGBERT P. WATSON, late of "The Scientific American," Author of "The Modern Practice of American Machinists and Engineers." Illustrated by Seventy-eight Engravings. $1 50

CONTENTS. CHAPTER I. The Foot-Lathe. II. Tools. III. Scrapers. IV. Chasers, etc. V. Chucking. VI. Metal Spinning. VII. Ornamental Cutting. VIII. Centres. IX. Fancy Turning. X. Ornamental Woods. XI. Wood Turning. XII. Tools for Wood Turning. XIII. Tool Tempering, etc. XIV. Artistic Wood Turning. XV. Stamp Inlaying. XVI. Designs in Mosaic. XVII. Finishing the Outside. XVIII. Inlaying—continued. XIX. Ornamental Designs for Inlaying. XX. General Summary—Lacquers, Soldering, Varnishing and Polishing, Brushes, Pearl, Miscellaneous Tools, Curving Veneers, Cutting Miscellaneous Materials.

Watson.—The Theory and Practice of the Art of Weaving by Hand and Power:

With Calculations and Tables for the use of those connected with the Trade. By JOHN WATSON, Manufacturer and Practical Machine Maker. Illustrated by large Drawings of the best Power Looms. 8vo. $10 00

CONTENTS.—INTRODUCTORY REMARKS. The Antiquity of Weaving—The Indian Mode of Weaving—An Old Tradition—Weaving introduced into Great Britain—The Progress of Weaving, found from the Consumption of Cotton—Prices of Cotton in different years—The probable increase of the Consumption of Cotton.

CHAPTER I. Gristing Yarn—Diameter of Reel—Hanks and Yards in one Spindle—Yarn in Cope—Yarn on Beam—Yarn in Chain—How Spinners make an Average Number—Linen Yarn—Wool Yarn—The Scotch and English Reed—The Fineness of Cloth

by Porters—A Uniform Standard—Calculation of Warps—Number or ends in a Web—Warp in a Web—Short Method—The Shrinkage in Cloth—Calculation of Wefts—Short Method for finding the Quantity of Weft.

II. Ancient Mode of Weaving, &c.—Winding Machine—Winding from Bobbins, Copes, and Hanks—Pirn Winding Machine—Warping Mill—Warping by Power—Warping Striped Work—How to make the Patterns—Beaming Yarn, Dyed in Chain—Sizing—Dressing—Crank-Dressing Machines—Cylinder Machine—Setting the Reeds—How to make Dressings—Tape-Leg Dressing Machine—Drawing or Entering the Web—Twisting—Draughts or Treading—Plain Cloth—Tweeling—Three Leaf Tweel—Herring Bone Tweel—Four Leaf Tweel—Sheeting Tweel—A Seven, Eight, and Nine Leaf Tweel—Blanket Tweel—Five Leaf Tweel for Damasks—Ten Leaf Fancy Tweel—Twelve Leaf Fancy Tweel—Sixteen Leaf Satin Tweel—Diapers for Three; Four. Five, Six, Seven, and Eight Leaves—Eight Leaf Diaper, with Fourteen Treads—Ten Leaf Diaper, with Thirty-six Treads.

III. Starting Power Looms—How to arrange and place the Looms—How to Level the Looms—How to find the Length of the Belt—Selecting the Shuttles—How to Pitch the Loom—Putting the Web in the Loom—How to find the proper Pinion for a given number of Shots.

IV. On Power-Looms—The old Power-Loom at Pollockshaws—The advantage of its Uptaking Motion, and its Movable Reed—An old Method for driving Power-Looms—Double Looms, Vertical and Horizontal—Their Advantages and Disadvantages for two Webs—Two Webs in the Hand-Loom—Air Pump Pick—Common Power-Loom—Weft Stopper—Fly Reed—Bullough's Specification—Remarks on Bullough's Improvement—Todd's Loom—Float or Scob Preventer—Shuttles with Hooks or Cutters—A Contrivance for Changing the Shuttle—Articles about a Loom.

V. Check and Damask Power-Loom—Description of the Drawings—How the Jacquard gets its motion—Form of Cam—Disengaging Apparatus—Mode of Working the Heddles—The Stenting Rollers—Selvage Protector—Shifting of the Shuttle Boxes—Taking back the Driver—Box Protector—Double Weft Stopper—Mounting a Harness Loom—Mails, Leads, Harness Twine—Slabstock—Harness or Hole Board—Standers—How to prepare the Harness—Tying up the Harness—Position of the Jacquard Machine—Adjusting the Jacquard Machine—Making Cloth—Pressure Harness Looms—How the figure is formed—How to find the Threads for each Mail—Drawing the Web—Mounting the Heddles—How to regulate the number of Shots for each Card—The use of the Stenting Rollers for Flax Yarn—Shedding a Pressure Harness—Power-Loom, with Six Shuttles—Making Cloth Patterns—Hints for making Check Looms—Putting on the Check Pattern.

VI. Lappet Weaving, &c.—Imitation of Sewing—Ground of Lappet Cloth—Different kinds of Whip—How Whip should be made—Lappet Loom—Lappet Wheel—New kind of Lappet Wheel—Lappet Needles and Pins—Lappet Lay—Arranging the Frames and Needles—Best kinds of Lappet Looms—Starting a Lappet Web—Drop Lappets—Gauze Stripes—Plain Gauze—Gauze made without Heddles—Jacquard Machine for working Gauze and Lappets—Sewing Frames for Looms—The Principle of Sewing Frames—Mode of working the Frames—Rack and Circle Frames—Tube or Bottle Sewing Frames—The Difficulties of applying the Sewing Frames to the Power-Loom.

VII. Mounting for Tweels, Diapers, &c.—How the Tweeling Shafts are Driven—Top Mounting for Three Leaves—Four Leaf Mounting—Double Barrel—Mounting for Five Leaf Tweel—Traverse of Treadle—Diameter of Barrel—Tweeling Treadles—Mounting for a Six Leaf Tweel—Mounting for a Seven Leaf Tweel—Mounting for an Eight Leaf Tweel—Four Shots of Tweel and Plain alternately—Plain and Tweel Stripes in the Warp—Diaper and Plain Cloth—Mounting for a Ten Leaf Tweel—Mounting for a Twelve Leaf Tweel—Mounting for Large Tweels—Mounting for a Sixteen Leaf Tweel—Mounting for Diapers—Mounting for Three Leaf Diapers—Mounting for Four Leaf Diapers—Mounting for Five, Six, Seven, and Eight Leaf Diapers—Mounting for Ten Leaf Diapers, with Thirty-six Threads—Diced Work—Double Cloth Mounting—Tube Weaving—Bags woven without a Seam—Bed and Toilet Covers—To make Broad Cloth in a Narrow Loom—Crumb Cloths—Carpets Plain and Tweel, with Weft Cords—Tape Checks made with one Shuttle.

VIII. Calculations, Tables, &c.—Costing Goods—Rating for Shirting—Rating for a Tape Check—Rating for a Blue and White Check—Form of Rating Book—On cost Expenses—Statement for Expenses for One Year—Charges for One Loom per Day—The Advantage of a Large Production—Manufacturers', Warpers', and Beamers' Tables.

IX. Miscellaneous Remarks connected with Power-Loom Weaving—Erecting a New Factory—Situation—Size of the Mill—Arrangement—Steam Boilers—How to keep the Boilers Clean—Management of Furnaces—Smoke Burning—New Patent Furnace—Steam Engines—Speed Indicator—Gearing—New Mode of Driving Looms without Belting—Calculations of Speeds—Speed of Engine—Speed of Shafts—Examples—Safety Valves—Quadrant—New Mode of Picking (W. & J. Todd's).

Williams.—On Heat and Steam:

Embracing New Views of Vaporization, Condensation, and Explosions. By CHARLES WYE WILLIAMS, A. I. C. E. Illustrated. 8vo. . $3 50

CONTENTS.—SECTION I. ON THE THREE STATES OF WATER. Water considered Chemically, Physically, and Dynamically. SECTION II. VAPORIZATION. What is Vapor? How and where is Vapor formed? What are the Special Properties of Vapor? In what does Vapor differ, Physically and Dynamically, from Water? What are the Relative Proportions of Latent and Sensible Heat in Water or Vapor? What Relation has Vapor to Electricity? Views of various Writers on Vaporization; Globules of Steam; The Change from the Vaporous to the Liquid State; Strata of Liquid Atoms; Generation of Vapor Atoms; Rapid Formation and Dynamic Effect of Vapor; Diffusion of Vapor; Homogeneous Temperature of Vapor; Vapor in a Dynamic Point of View as an Elastic Fluid; Vapor not Heated Water. SECTION III. ON THE DIFFUSION OF VAPOR AND OTHER ELASTIC FLUIDS. Elasticity defined; What the Gaseous State is due to; Dalton's Theory of Mutual Repulsion; Vapor an Elastic Fluid; Air; Gravity nothing to do with the Mixing and Diffusion of Gases; Attraction of Liquid Atoms; Simple Atmospheres; Compound Atmospheres; Illustrations of Diffusion. SECTION IV. OF THE HEATING AND EXPANDING OF WATER. Compressibility and Incompressibility; On Conductibility; Expansion; Respective Properties of Liquid and Vaporous Atoms. SECTION V. OF THE BOILING POINT. Attraction and Repulsion of Atoms; Unit of Heat; Action of Units of Heat on Atoms of Water; Latent and Sensible Heat. SECTION VI. ON EBULLITION. Surface Bubbling; Incipient Ebullition; "General Mass" of a Liquid; True Cause and Source of Ebullition; Experiments on Ebullition; The Direct Cause of Bumping and Explosions; Effect of the Presence of Vapor in Excess of Saturation; Experiments with Vapor in Excess of Saturation; Vapor in Water; What Ebullition results from; Illustration of the Stream of Globules in Ebullition; Illustrations of the Tendency of Vapor Atoms towards a Nucleus; Prevailing Theories: Process, Purpose, and Utility of Ebullition; Conclusion to be drawn from the Facts of Ebullition. SECTION VII. OF VAPOR IN WATER. Classification of Vaporized Bodies; Gases or Vapors in Space; Experiments on Vapor in Water; Quantity of Vapor; Experiment showing the actual Existence of Vapor in Water; Experiment showing the Formation and Ascensional Power of Globules. SECTION VIII. ON CONDENSATION. Cause and Process of Condensation; Condensation in the Steam-Engine; Experiment in Condensation; Change in the Electric Condition of Vapor Atoms; Condensing and Non-condensing Engines; Vapor parting with Heat; Steam ejected into a Body of Cold Water. SECTION IX. OF THE VACUUM. Action of Cold Water in producing a Vacuum; Experiments on the Vacuum; Assumed Effect of Water in depriving Steam of its Heat; Reciprocal Relations of Vaporous and Liquid Atoms. SECTION X. ON EVAPORATION. Distinction between the Generation and Escape of Vapor; Experiment Illustrative of Vaporization and Evaporation; Reduction of the Temperature the Result of the Escape of Vapor; Dalton's Theory of Diffusion; Experiments showing the Loss of Water by Evaporation. SECTION XI. OF SPONTANEOUS EVAPORATION. The Involved Character of the Prevailing Theory of Spontaneous Evaporation; Accumulation of Vapor over the Surface of Water; Water evaporates in the Form of Vapor; Vapor present in Water at all Temperatures; Water does not Evaporate, but merely parts with its Vapor. SECTION XII. ON BOILER EXPLOSIONS. Explosions on the Starting of Engines; Flashing of Water into Steam a supposed Cause of Explosions; Agitation of Water in the Boiler a supposed Cause of Explosions; Explosions equally attendant on an Over or an Undercharge of Water in the Boiler; Electricity as a Cause of Explosions; Decomposed Steam as a Cause of Explosions; Overpressure as a Cause of Explosions; Explosions at Ordinary Pressure; Momentum of Combined Steam and Water as a Cause of Explosions: Illustrations of Steam and Experiments showing the Existence of the same Quantity of Steam in each Cubic Inch of a Boiler; Examination and Experiments on the Sudden Increase of Pressure and Risk of Explosions; Boilers of the Great Eastern; Steam below the Water Line; Violent Movement in Boilers on Starting Engines; Deficient Supply of Water as a Cause of Explosions; Rarity of Explosions in Marine Boilers; Franklin Institute Experiments on Explosions; Pressure of Steam on the Water in the Boiler; Free Caloric in the Boiler. SECTION XIII. ON THE JET. Great Importance of the Jet; Experiments and Illustrations of the Principle on which the Efficiency of the Jet depends; Jets applied in Aid of Marine Boilers; Steam Jets and Induced Current of Air in Furnaces; Mechanical Use of the Jet; Importance of a Due Relation between the Sectional Area of Jets and their Distances; Experiments with Air Meter and Steam Jets; Value of the Jet System. APPENDIX. Remarks on the Mode of Effecting the Combustion of Coal in Furnaces; Index.

Weatherly.—Treatise on the Art of Boiling Sugar, Crystallizing, Lozenge-making, Comfits, Gum Goods,

And other processes for Confectionery, etc., in which are explained, in an easy and familiar manner, the various Methods of Manufacturing every Description of Raw and Refined Sugar Goods, as sold by Confectioners and others. 12mo. $2 00

Will.—Tables of Qualitative Chemical Analysis.

With an Introductory Chapter on the Course of Analysis. By Prof. HEINRICH WILL, of Giessen, Germany. Second American, from the ninth German edition. Edited by CHARLES F. HIMES, Ph.D., Professor of Natural Science, Dickinson College, Carlisle, Pa. 8vo. . $1 50

CONTENTS.—Course of Qualitative Chemical Analysis. Table I. *Preliminary Examination*—Behavior of inorganic substances at a high temperature, and with reducing agents. II. *Preliminary Examination*—Flame reactions with the gas-lamp. III. *Preliminary Examination*—Flame reactions (Incrustations). IV. *Preliminary Examination*—Behavior of metallic oxides with phosphorus salt and borax. V. *Fluxing*—Conversion of insoluble compounds into soluble. VI. *Detection of Metallic Oxides*—Synoptic statement of their behavior with chlorhydric acid, sulphydric acid, ammonic sulphide, ammonia, and ammonic carbonate. VII. *Detection of Metallic Oxides*—Treatment of the precipitate obtained by sulphydric acid. VIII. *Detection of Metallic Oxides*—Treatment of the precipitate obtained by ammonic sulphide. IX. and X. *Detection of Metallic Oxides*—IX. Treatment of the precipitate obtained by ammonic carbonate (carbonates of the alkaline earths). X. Treatment of the liquid which is not precipitated by sulphydric acid, ammonic sulphide, or ammonic carbonate (magnesia and the alkalies). XI. *Detection of Acids or Halogens*—Behavior of the more important acids, upon heating their salts with concentrated sulphuric acid. XII. *Detection of Acids*—Behavior of the more important acids with precipitants, chlorhydric and nitric acid, baric and calcic chloride, and magnesic sulphate. XIII. *Detection of Acids*—Behavior of the more important acids with ferric chloride, argentic nitrate, and indigo solution. [XIV. *Detection of Metallic Oxides*—Second method for the treatment of the filtrate from the precipitate by H_2S, to replace portions of Tables VI and VIII] C. F. H.

Worssam.—On Mechanical Saws:

From the Transactions of the Society of Engineers, 1869. By S. W. WORSSAM, Jr. Illustrated by 18 large plates. 8vo. $5 00

Wohler.—A Hand-Book of Mineral Analysis.

By F. WÖHLER, Professor of Chemistry in the University of Göttingen. Edited by HENRY B. NASON, Professor of Chemistry in the Rensselaer Polytechnic Institute, Troy, New York. Illustrated. In one volume 12mo. $3 00

This volume is one of the best and most useful of its kind extant, and is made doubly valuable for reference by a full and exhaustive INDEX. Written, as it has been, by one of the most eminent of living Chemists, it is also edited by one of the ablest of American Chemists. No Chemical Library or Laboratory can be complete without it. No manufacturing or analytical Chemist, no Miner, Metallurgist, Geologist, or Mineralogist can dispense with it without loss. As a Text-book for students in analytical chemistry, especially in laboratory practice, it may be said to be almost without a rival, certainly without a superior.

CONTENTS.—Preface to the American Edition.—Preface.—Chloride of sodium.—Chloride of silver.—Sulphate of soda.—Tartrate of potassa and soda.—Sulphate of soda and ammonia.—Sulphate of potassa and magnesia.—Carbonate of potassa and magnesia.—Epsom salt and Glauber's salt.—Phosphate of soda and ammonia.—Phosphate of magnesia and ammonia.—Chlorides of potassium, sodium, and magnesium.—Dolomite and bitter-spar.—Bone-ash.—Apatite.—Barite, celestite, and gypsum.—Alumina-alum.—Iron-ammonia-alum.—Alumina-chrome-alum.—Wavellite and phosphates of alumina in general.—Spinel (Alumina and magnesia in general).—Alumina and sesquioxide of iron.—Phosphoric acid and sesquioxide of iron.—Hematite and limonite.—Magnetite.—Siderite.—Bog iron-ore.—Wet assay of iron.—Iron assay.—Sulphate of copper.—Chalcopyrite.—Sphalerite, or blende.—Smithsonite.—Brass.—Oxides of manganese, iron, and zinc.—Cadmium and zinc.—Cadmium and copper.—Galenite.—White lead.—Pyromorphite.—Silver and lead.—Silver and copper.—Silver assay.—Gold and copper.—Gold and silver.—Amalgams.—Mixtures of protoxide of mercury, minium, and cinnabar.—Tin and copper.—Tin and lead.—Bismuth, lead, and tin.—Bismuth and copper.—Schweinfurt green.—Arsenic and lead.—Arsenic and tin.—Tartar-emetic.—Antimony and lead.—Bournonite.—Zinkenite.—Berthierite.—Red silver-ore.—Tin and antimony.—Arsenic and antimony.—Arsenic, antimony, and tin.—Tetrahedrite.—German silver (argentan).—Niccolite.—Smaltite.—Cobaltite.—Manganese and cobalt, or nickle.—Meteoric iron.—Platinum metals and ore.—Iridosmine and platinum residues.—Thallium.—Indium.—Tellurium ore.—Natrolite, thomsonite, etc.—Ilvait.—Chrysolite (olivine).—Datolite.—Ulexite.—Orthoclase.—Pyroxene, amphibole, garnet, idocrase, epidote.—Beryl.—Topaz.—Fluorite.—Cryolite.—Zircon.—Cerite.—Gadolinite.—Thorite.—Triphylite.—Titanite (sphene).—Menaccanite (titanic iron).—Rutile.—Columbite (niobite).—Tantalite.—Wolframite.—Scheelite.—Wulfenite (molybdate of lead).—Molybdenite.—Brown iron-ore, containing vanadium.—Vanadanite (vanadanite of lead).—Chromite (Chrome-iron-ore).—Chromate of lead.—Uranite.—Seleniferous deposit from sulphuric acid chambers.—Selenium soot.—Chausthalite (selenide of lead).—Cast-iron.—Ash of the refining-hearth.—Glass.—Clay.—Common limestone, hydraulic limestone, marl.—Iodide, bromide, and chloride of sodium.—Crude common salt.—Incrustations from salt pans.—Mineral waters, well-waters, saline springs.—Soils.—Ashes of plants.—Guano.—Oxalate and phosphate of lime.—Alkalimetry.—Valuation of manganese ores.—Chlorimetry.—Analysis of nitre.—Gunpowder.—Hydrocyanic acid.—Ferrocyanide of potassium.—Examination for arsenic in cases of poisoning.—Examination for phosphorus in cases of poisoning.—Silicates.—Separation of the iron and manganese.—Analysis of the materials soluble in nitrate of ammonia.—Examination of the volatile materials in silicates.—Equivalent weights of the elements.—Equivalent weights of compound bodies.—INDEX.

Warn.—The Sheet-Metal Worker's Instructor:

For Zinc, Sheet-Iron, Copper, and Tin-Plate Workers, etc. Containing a selection of Geometrical Problems; also, Practical and Simple Rules for describing the various Patterns required in the different branches of the above Trades. By REUBEN H. WARN, Practical Tin-plate Worker. To which is added an Appendix, containing Instructions for Boiler Making, Mensuration of Surfaces and Solids, Rules for Calculating the Weights of different Figures of Iron and Steel, Tables of the Weights of Iron, Steel, etc. Illustrated by Thirty-two Plates and Thirty-seven Wood Engravings. 8vo. $3 00

CONTENTS.—A SELECTION OF GEOMETRICAL PROBLEMS.

PLATE I.—To draw a straight line parallel to a given line, and at a given distance from it—To bisect a given straight line—To divide a given line into any number of equal parts—To draw a straight line equal to the circumference of a given circle—To construct a plain scale for drawing a small plan proportionate to a larger one—To find the centre of a circle or the radius of a curve—To draw a circle through any three given points—To erect a perpendicular.

II.—To strike a segment by a triangular guide, the chord and height being given—The chord and height of a segment of a circle of large radius being given, to find the curve without recourse to the centre—Having an arc of a circle given, to raise perpendiculars from any point or points without finding the centre—To draw a tangent to a circle or portion of a circle without having recourse to the centre—Upon a given straight line to describe any regular polygon—Upon a given side to draw a regular pentagon.

III.—Upon a given side to draw a hexagon—To draw a heptagon—How to describe an octagon in a given square—To draw a straight line equal to any given part of a circle—To find the stretch out of a semicircle—Definition of polygon—Definition of parallelogram.

IV.—To strike an ellipse or oval with the compasses, the length or major axis being given—To describe an ellipse within a given square, or when the major and minor axes are given—Method of drawing an egg-shaped oval—Graphic illustration of what an ellipse really is—Another method of drawing an ellipse—To draw a parabola—To draw an ellipse with a trammel.

V.—To strike a pattern for a round, tapering, or flue article, or a frustum of a cone—The plan of a round flue body to be cut in three pieces—Two or three methods of describing ovals.

VI.—The pattern of an article where the sides are straight and the ends semicircular—The pattern of an oblong tapering pan in two parts or sections.

VII.—The pattern for a tapering oblong article in one piece, such as a flue oblong candlestick—The pattern for a tapering oval article in four pieces or sections.

VIII.—To describe a tapering oval body in one piece—A method of drawing an ellipse or oval with a string and pencil.

IX.—The pattern of an egg-shaped oval tapering body—Another method of describing an oval tapering body.

X.—To describe a tapering oval body where the tapering is not equal on all sides.

XI.—The pattern for a square tapering article or pyramid—The pattern for a tapering octagon body in one piece—The pattern for a diamond-shaped tapering body in one piece—The pattern of a square funnel where one side is straight or upright.

XII.—The pattern for a square or rectangular tapering top or tray, with sides and bottom in one piece—The pattern for a hexagon mould or tray, having the bottom and sides in one piece—The pattern of an irregular octagon pan or tray, with the sides or bottom in one piece—The pattern of an oblong pan, with round corners, but struck from different centres, and tapering more at the ends than sides.

XIII.—A pattern for a tapering top, the base being straight at the sides, and with circular ends, the hole in the top to be circular and parallel with the base (similar to a tea-bottle top).

XIV.—The pattern for a tapering article, oval at the base and round at the top (such as an oval canister top, having a round hole for the neck and cover).

XV.—A pattern for the tapering sides of a tray, having various curves.

XVI.—The pattern for an oblong tapering bath.

XVII.—The pattern of an elbow at right angles, in a round pipe—A pattern of an elbow in a round pipe at any angle required (in this case an obtuse angle)—The pattern of a tapering piece of pipe to join two upright cylinders to form a double elbow.

XVIII.—The pattern for a T-piece, or to join two cylinders at right angles—The pattern of two cylinders for joining at an oblique angle for slanting direction.

XIX.—The pattern for a lobster-back cowl—The pattern for a round pipe, to form a semicircle for connection to other pipes.

XX.—The pattern for a cone and cylinder to intersect or meet at right angles with their axes.

XXI.—A cylindric section through any given angle—To draw an ogee arch—Another method—To find the covering of an ogee dome, the plan of which is hexagonal.

XXII.—The pattern for a rectangular base and bottom in one piece, where the flue or curve is equal on all sides (such as may be used as a base for either an aquarium or a fern-case)—The pattern for a hexagon base.

XXIII.—The pattern for a vase, octagon shape.

XXIV.—The pattern for a vase having twelve sides (duodecagon).

XXV.—The pattern for a cone with an elliptic base—The pattern of an oblique cone, or the frustum of a cone cut parallel with the base.

XXVI.—The pattern for a round-end bath tapering more at the ends than at the sides.

XXVII.—The pattern for a hip bath.

XXVIII.—The pattern for a travelling sitz bath.

XXIX.—The pattern for a globe formed of twelve pieces joined together—The pattern for a triangular pedestal, or pyramid, with all three sides alike (an equilateral triangle)—To obtain the radius required for striking the pattern of a slightly tapering article, without the necessity of producing lines to meet.

XXX.—The patterns for the sides of an irregular octagon pan.

XXXI.—The pattern for a cover and neck of an irregular octagon article, such as a tureen.

XXXII.—The pattern for the top of a jack screen.

APPENDIX.—RULES FOR BOILER-MAKING, ETC.: Template making—To build a tubular boiler of 36 inches, inside diameter of two plates in the circle—To find the breadth of the template for a given dome at any particular place, by calculation—To find the template for a given short egg-end spherical—To find the template for a given long egg-end parabola; the breadth and length of the template at any particular place—To find the templates for a given barrel spheroid; the breadths and lengths at any particular place by calculation. MENSURATION OF SURFACES: Four-sided figures—Triangles—Trapezoids and trapeziums—The circle—Ellipse or oval—Mensuration of solids—For superficies—For the solidity—Cylinders and prisms—Cones and pyramids—Spheres and segments of spheres. APPROXIMATE RULES FOR FINDING THE WEIGHT OF DIFFERENT FIGURES OF WROUGHT IRON AND STEEL: For round iron—For square iron—For square, angled T, convex, or any figure of beam iron—For square cast-steel—For round cast-steel—Table I. Weight of wrought iron and steel—II. Weight of boiler plates—III. Weight of malleable round iron—IV. Weight of malleable square iron—V. Weight of malleable flat iron—VI. Weight of a superficial square foot of plate or sheet iron—VII. For ascertaining the weight of malleable iron pipes—Rule—VIII. Weight of ordinary angled iron. INDEX.

Warner.—New Theorems, Tables, and Diagrams for the Computation of Earth-Work:

Designed for the use of Engineers in Preliminary and Final Estimates, of Students in Engineering, and of Contractors and other non-professional Computers. In Two Parts, with an Appendix. Part I.—A Practical Treatise; Part II.—A Theoretical Treatise; and the Appendix. Containing Notes to the Rules and Examples of Part I.; Explanations of the Construction of Scales, Tables, and Diagrams, and a Treatise upon Equivalent Square Bases and Equivalent Level Heights. The whole Illustrated by numerous original Engravings, comprising Explanatory Cuts for Definitions and Problems, Stereometric Scales and Diagrams, and a Series of Lithographic Drawings from Models, showing all the Combinations of Solid Forms which occur in Railroad Excavations and Embankments. By JOHN WARNER, A. M., Mining and Mechanical Engineer. 8vo. $5 00

Wedding.—The Metallurgy of Iron;

Theoretically and Practically Considered. By Dr. HERMANN WEDDING, Professor of the Metallurgy of Iron at the Royal Mining Academy, Berlin. Translated by JULIUS DU MONT, Bethlehem, Pa. Illustrated by 207 Engravings on Wood, and 3 Plates In one volume, 8vo. (In press.)